THE FOUNDRY

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The National Association of Stove Manufacturers.

Why it is Necessary.

By LAZARD KAHN, President.

You asked me a few days since to contribute for publication a paper concerning the National Association of Stove Manufacturers. I comply under stress of many cares, hence with insufficient opportunity to do you or myself justice.

The preamble to the Constitution of that organization reads as follows:

"We, the stove manufacturers of the United States, assembled for the purpose of establishing an association by which we may obtain full information of the statistics and conditions of the stove trade of this country, promote the frequent interchange of ideas in regard to the manufacture of the same, and securing harmonious action in all matters pertaining to its interests, do form this association and establish the following constitution," etc.

To prove that these purposes have been subserved, it is only necessary to say that the organization, out of deserved respect for the State of its nativity, will celebrate its twenty-fifth or silver anniversary in May, 1896, in the City of New York, and that by reasonable inference it could not have survived and received the constant and loyal support of manufacturers representing upwards of 60 per cent of the stove producing capacity of the whole country unless it had been entirely worthy of it and returned more than an equivalent for the sacrifices which its sustenance has imposed upon its members.

It is to be expected that the organization has not escaped criticism, both from within and without. Having never abrogated infallibility to itself, like all human agencies, it may cheerfully avow its shortcomings without disparaging its utility and claims upon the support and respect of every one directly or indirectly identified with the stove trade.

Within recent weeks a considerable number of manufacturers have joined its ranks. Among the latter are several who withdrew at various periods in the past and whose gladsome return is accepted as a substantial vindication of the association.

Of all the successful and satisfactory meetings of the past, none were more so or more largely attended than the last annual meeting recently held in Chicago, and it may be safely asserted that the organization is entering a new era of usefulness, beneficial alike to stove manufacturers, their employes and dealers as well. There certainly was never a time when the future of this industry was so pregnant of revolutionary changes and where wise counsel seemed so essential in averting disasters.

No manufacturer of stoves can stay outside without serious injury to himself or his interests, or without unfairness to the organization, whose good influences and services they share in part at least, without bearing any of the burdens which participation imposes. It would be difficult indeed to name one single tenable reason to prove membership a disadvantage.

The association, contrary to the belief of many, has never in the past and does not now attempt to establish prices or impose a single obligation which abridges complete indepednence and liberty of action on the part of its members.

Its meetings are for the purpose of combined efforts in promoting general intelligence and welfare; for collecting statistics and basing thereon future operations; for mutual information as to best methods of production and distribution of products; for the moral condemnation of vicious practices in the trade and their reformation thereby; for suggesting wise legislation in respect to all industrial and commercial interests and for fostering social intercourse and through

its influences to rob competition of the animosities it would otherwise engender.

Associations among those engaged in commercial and industrial occupations are coincident with the history of civilization, and they are justly regarded as among its most powerful pioneers. They are to be found in every city of consequence, and indeed in all trades and professions, and their existence vindicates their high usefulness and necessity. The N. A. S. M. belongs and is of substantially that category, and having been conservative and eminently regardful of the rights and interests of all classes connected with the industry and in those outside, it is entitled to the respect it has received and to the support which it solicits.

The Stove Founders' National Defence Association.

Why Founded and what it has Accomplished.

By HENRY CRIBBEN, President.

The Stove Founders' National Defense Association was organized in Cleveland, Ohio, in June, 1886, with the writer as President, and while there seemed some doubt among some of those present as to its ultimate success, yet time has more than justified its founders in having predicted that it would be the means of putting an end to the needless strife between stove manufacturers and their employes that had previously been of such frequent occurrence. Not only has it done this, but it has also inaugurated such an entirely different order of things that the best element among the molders themselves do not hesitate to declare that it has been a protector and defense to them as well as to their employers.

It has been estimated that at least three million dollars have been lost to stove molders and their employers during the many strikes that have occurred since the close of the war and the coming together of the employers and employes, through the medium of the Defense Association and the Iron Molders' Union, to say nothing of the annoyance and in some cases suffering and loss that has been incidental to the above.

The last strike or trouble of any note that we have had occurred in 1890 and involved the Rochester Co-operative Stove Company, and although it was bitterly contested on both sides, the molders at last conceded their defeat.

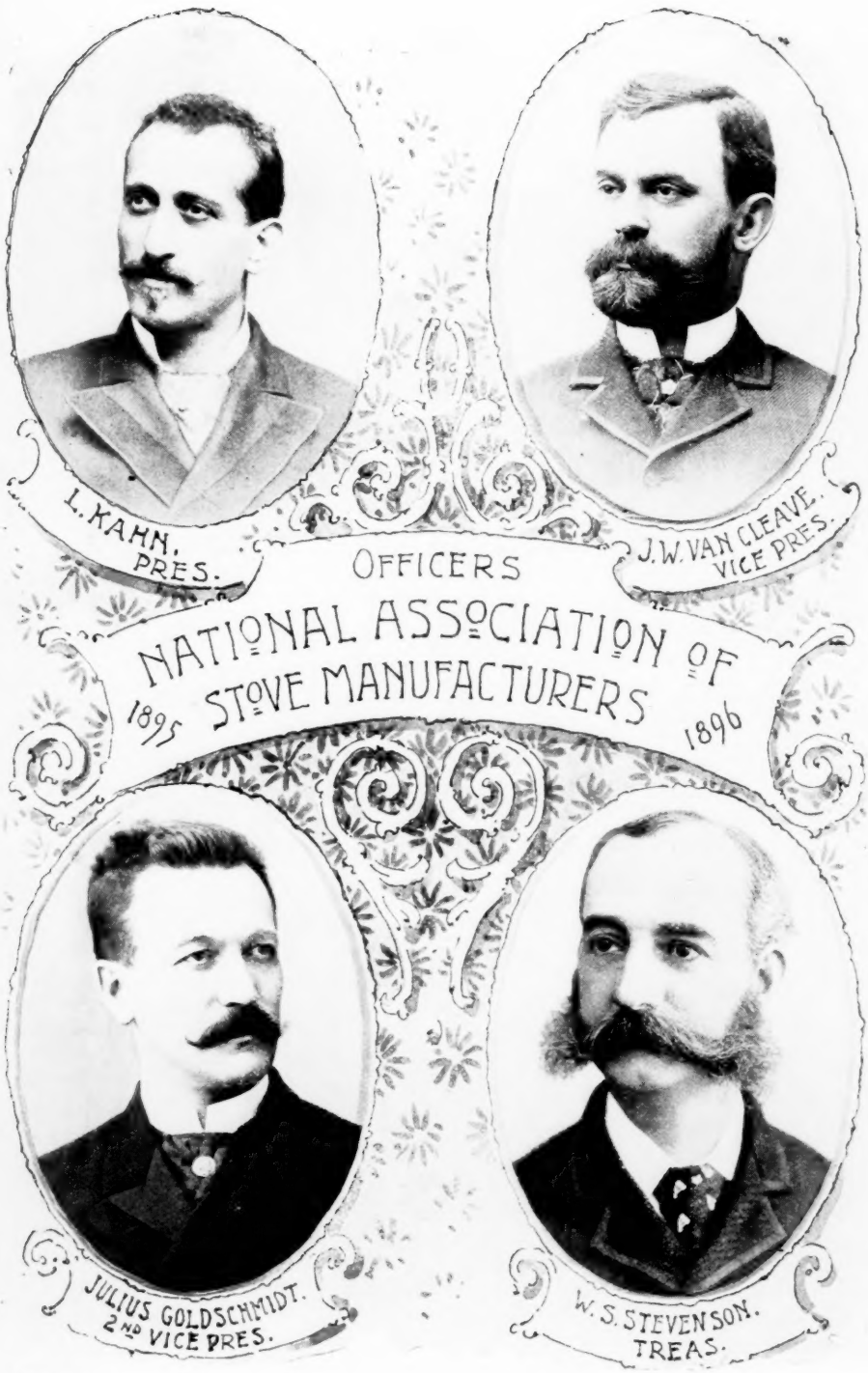
During various interviews between the officers of the Association and those of the Molders' Union, the former deprecated the necessity of internecine strife forced upon them and expressed a wish that other and better plans of settling disputed points could be devised and enforced. Immediately after the pronounced defeat at Rochester, Mr. Martin Fox, having displaced Mr. Fitzpatrick as President of the Molders' Union, addressed a letter dated November 29, 1890, to Secretary Hogan, stating that a general convention of his organization had authorized the appointment of a committee to meet a similar committee of the D. A. for the purpose of "arranging plans for future action, whereby questions of wages or other differences may be mutually settled without incurring loss or injury to the parties concerned," and stating that such committee was ready to meet and confer with the D. A. committee at any time, to make arrangements to guide them in their future actions. Under the authority of a resolution adopted at Detroit, in 1887, the President appointed a committee of five to meet the molders' committee, and a conference was held March 25, 26 and 27, 1891, in Chicago. The result was the adoption of resolutions providing that there shall be no strikes, no lockouts, but that all differences between the molders and their employers, when a majority of the former are members of the I. M. U., shall be referred to the presidents of the two organizations for settlement, and if they cannot agree, to a committee consisting of three members of each of the organizations. These resolutions were substantially ratified by the members at large of both bodies. A second conference was held in 1892 and further resolutions were adopted providing:

A. That the general rate of molders' wages should be established for each year without change.

B. That each year shall commence on each April 1st.

C. That the established prices of work in a shop shall be the basis for the price of new work of similar character and grade.

All of which was ratified by the members at large of both organizations. All these resolutions are still in force. Under them there have been several cases decided, a few of


L. KAHN.
PRES.
J.W. VAN CLEAVE.
VICE PRES.
OFFICERS
NATIONAL ASSOCIATION OF
STOVE MANUFACTURERS
1895
1896
JULIUS GOLDSCHMIDT.
2ND VICE PRES.
W. S. STEVENSON.
TREAS.

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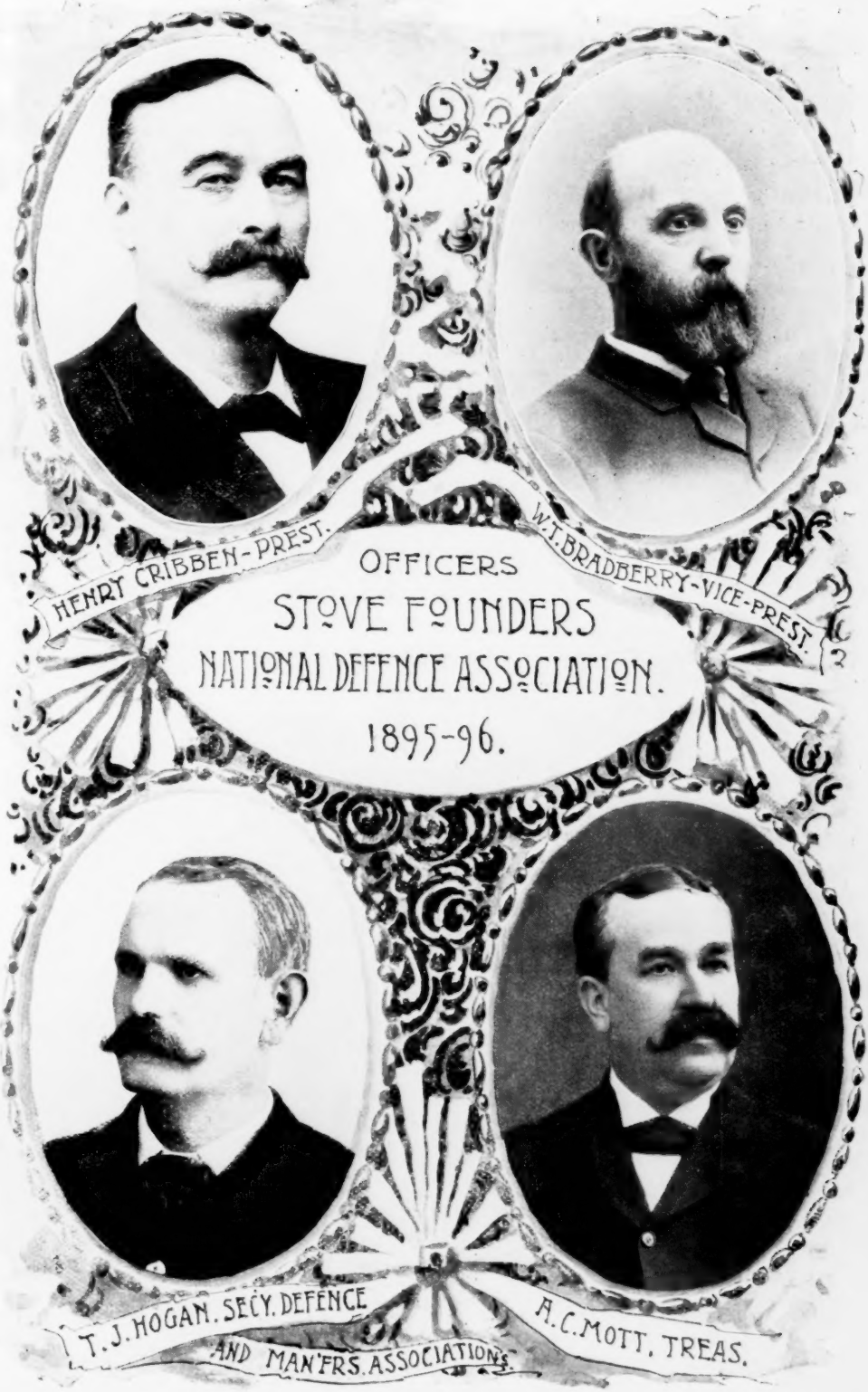
HENRY CRIBBEN - PREST.
W. T. BRADBERRY - VICE-PREST.
OFFICERS
STOVE FOUNDERS
NATIONAL DEFENCE ASSOCIATION.
1895-96.
T. J. HOGAN. SEC'Y. DEFENCE
AND MAN'FRS. ASSOCIATIONS.
A. C. MOTT. TREAS.

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which are given here for purposes of illustration.

Case A. A manufacturer put into the sand a new range, practically a duplicate of one made in another district. The molders asked a price relative, as they claimed, to other work in the shop. The manufacturer claimed that the range was of inferior class to his general work, and could be made cheaper, that the price put upon it was much higher than upon other similar ranges in districts where such range had to be sold, and was, therefore, prohibitory. He demanded a settlement on the basis of other prices of molding established by union molders for similar ranges. This was refused by the molders and the matter was referred to the Defense Association. The two Presidents met, and determined a price list which gave the manufacturer substantially what he had claimed, and the decision was put into force and remains so.

Case B. A local union made a demand for an advance of 10 per cent on the general price. Five firms would be directly affected, and the advance would of necessity have become prevalent throughout a very large district. A committee of manufacturers and molders met, and the men gave general reasons for their demand, among which were that their prices were not as high as those of competing districts. The demand was refused. It was persisted in and finally submitted to the two Presidents, who decided that there was no reason for a general advance, but inasmuch as it was admitted by the manufacturers concerned that there did exist an inequality in a certain species of wood stove made by all of them, the price on that particular stove should be increased 5 per cent for the 8-inch and 10 per cent for the 9-inch.

Case C. An accident happened to an engine. There was short iron and dull iron and work lost in consequence. The men stopped work and claimed full pay for all work lost and refused to resume operations until the amount of claims was actually paid to them. The President of the I. M. U. and the Secretary of the D. A. met and investigated. The Secretary D. A. refused to consider the matter until the men agreed to go to work and withdraw the claim as of a right. They did so. There were peculiar circumstances of an intricate character involved in and collateral to this case. It was deemed for the best interest of the manufacturer that he should pay the amount claimed, which was but a few dollars, upon their next pay day, subject, however, to an explicit statement by the President of the I. M. U. that the case had not been considered on the merits of the particular claims, and that no precedent as to payment for lost work was established by the verdict. The firm paid the claim in due time and the matter ended.

Case D. There had been dull iron and work lost, which the employers refused to pay for. The molders struck and remained out three days. Remonstrances were made to the President of the I. M. U., who ordered the men back to work at once, and they obeyed. The Secretary S. F. N. D. A. visited the foundry and interviewed the men and found that dull iron had been unnecessarily frequent. An agreement was then made satisfactory to both employer and employe that when iron was short or dull, oftener than twice in each calendar month, work lost in consequence should be paid for.

Case E. A claim was made upon a member for an advance of 10 per cent in the price of a range which had been established for ten years, on the grounds that the price was lower than that paid for other competing ranges in the same district. The manufacturer offered to compromise by advancing the price to the average of four other ranges, but this was refused. The matter was placed in the hands of the Defense Association. The two Presidents met, and with three other ranges before them, compared pieces and prices and found that although the aggregate price of molding the range was slightly lower than that of other ranges, yet relatively to the value of the molding it was equally high, and decided there was no just ground for an advance. The case was complicated by the fact that the molders had refused to make the range in defiance of their agreement; it had been given to apprentices to make and new apprentices were engaged, although the firm had previously a number in excess of the regulations of the Molders' Union, and the men demanded the discharge of the extra apprentices. Both these claims were subsequently withdrawn and the men are at work.

In March of the year 1893, the officers of the I. M. U. made a demand for a general advance of prices throughout the country of 15 per cent. A special meeting was called to consider this and refused to grant it. The molders demanded a conference, which was held in May, and the increase was again refused. Subsequently their committee appeared before another meeting of stove manufacturers, but the refusal of an increase was still persisted in, and none has been granted.

This completes the history of the organization to date. It is a recital of a series of successful contests unbroken by one single defeat or repulse, or compromise. It has never taken up an unjust or questionable case; therefore, it has deserved to win.

Officers of the N. A. S. M.

Lazard Kahn, Pres.

Lazard Kahn, the newly elected President of the National Association of Stove Manufacturers, was born at Imgiviler, Alsace, France, November 22, 1850. When but 16 he embarked for America with a bundle of clothes and a little trifle of pocket money.

He started West and on the way his bundle was stolen and his pocket was picked, leaving him penniless among strangers.

There were no lazy-bones in his body, however, and he set to work in a way that made ultimate success more than certain. At first he blacked stoves for a living, afterwards selling lamp burners and such trifles, and from that to selling stoves. In 1867 he entered the stove business as an employe of Charles Weis & Co., Nashville, Tenn. Two years later he became a junior partner in the firm, which became Weis & Kahn. He remained in the South until 1874, when he and his brother Felix came North and purchased each a one-fifth interest in the stove business of Martin Henderson & Co., Hanging Rock, O.

In 1876 Mr. Martin retired, the Messrs. Kahn bought his interest, the firm name changing to Henderson, Kahn & Co. In 1881 the Messrs. Kahn were joined by another brother, since deceased, and bought out all other interests, changing the firm name to F. & L. Kahn & Bros., Mr. L. Kahn looking after the practical management department, Mr. Felix Kahn being in charge of the general office business and Mr. S. Kahn the outside sales department. In 1884 this firm moved their works to Hamilton, O. Mr. Kahn is a pleasant and able linguist, a man of forcible ideas and strong opinions, a philanthropic employer, and a public spirited citizen. In his own bailiwick he has the same substantial popularity as that accorded him by the trade. Last year everybody down his way of his political faith wanted Mr. Kahn to run for Congress. That gentleman, however, is so attached to the stove business that even the glittering prize of political fame could not wean him away, even for a few years. Mr. Kahn is a most progressive man and under his administration many important advances in trade matters will unquestionably be made.

J. W. Van Cleave, 1st Vice-Pres.

J. W. Van Cleave is the hustling aggressive Vice-President of the Manufacturers' Association, and to the fact that he is a direct descendant of an old Holland family and had for a birthplace Kentucky may be attributed that steadfastness of purpose and energy for which he has been always conspicuous.

He was born in 1849, educated at the common schools and made his start in life with the stove firm of J. S. Lithgow & Co., Louisville, in February, 1867. Eleven years later, or in January, 1888, he became the principal owner and general manager of Buck's Stove & Range Co., St. Louis, Mo.

Few stove men have been individually more successful or built up or added to their reputations more during the past six years than Mr. Van Cleave, and we doubt if any stove company in the country has, relatively speaking, made more rapid progress towards the front of the procession than this one. This one fact alone speaks volumes for Mr. Van Cleave.

Julius Goldschmidt, 2nd Vice-Pres.

In electing Julius Goldschmidt Vice-President of the Brand Stove Co. of Milwaukee, as one deserving of some honor, the delegates to the Stove Manufacturers' Convention, inadvertently perhaps, honored themselves. His re-election was a fine tribute to their sound judgment, as Mr. Goldschmidt has previously filled with great credit other honorable positions, one of them being conferred by no less a gentleman than President Harrison.

He was born in Oesterode, in the Hartz Mountains, Germany, in 1846, coming to

Milwaukee, Wis., in 1866, when but 20 years old. Six years later he entered the employ of Brand & Co., which was subsequently reorganized as the Brand Stove Co., with Mr. Goldschmidt as Vice-President. He was the elector from the Milwaukee District on the Harrison Electorial ticket, and was afterwards for four years Consul-General for the United States of America to Austria-Hungary, residing at Vienna. In addition to this, in recognition of his splendid efforts in Europe on behalf of this country and the World's Fair, the directors appointed him an Honorary Commissioner in December, 1891.

He has for a long time been prominently identified with the educational, literary and art interests of his adopted city, and has held many positions of responsibility and trust other than those mentioned.

Walter S. Stevenson, Treas.

Mr. Walter S. Stevenson, who has been Treasurer continuously of the Stove Manufacturers' Association for four consecutive terms, and who was elected for the fifth time in Chicago last month, was born in Philadelphia December, 1843, and educated at the public schools. At the age of 17 he entered the business office of North, Chase & North, stove founders, of Philadelphia, where he remained for five years, filling many positions, such as purchasing agent, salesman, etc.

In May, 1865, while in their employ, he left Philadelphia on the first regular steamer leaving that port after the war, bound for Richmond, Va., with a large consignment of stoves and hollowware.

Although upon their arrival everything in the way of business was found to be in a very chaotic condition, over half the city in ruins, caused by the burning of cotton and tobacco warehouses, yet Mr. Stevenson disposed of his goods and the venture was an entire success.

In 1866 he opened a stove house in Philadelphia on his own account, as W. S. Stevenson & Co., in 1868 consolidating with Thomas Roberts & Co., the new firm becoming Thomas Roberts, Stevenson & Co., and in a short time they were compelled to enlarge their capacity over 50 per cent.

In 1880 they were burned out, losing everything, but immediately secured the unoccupied works vacated by North, Chase & North when they went out of business in 1874, and where Mr. Stevenson had been employed as a boy. Here they have been running steadily ever since. In 1887 their company became incorporated, Mr. Stevenson becoming President.

He is also President of the Stove Manufacturers' Association of Eastern Pennsylvania, which is the oldest local continuous association in the United States.

Officers of the S. F. N. D. A.

Henry Cribben, Pres.

When it comes to giving our readers a brief sketch of the life of that grand man who presides over the affairs of the Stove Founders' National Defense Association, we feel that so much ought to be said to give an adequate idea of the gentleman's career and its connection with the stove business that an entire issue devoted to no other purpose would be necessary.

During late years he has been so closely connected with the Defense Association that a history of one during that period would serve as a history of the other.

Mr. Henry Cribben was born in the Isle of Man, Great Britain, in the year 1833. He accompanied his parents to this country when he was about four years of age, and immediately took what advantage was to be secured in the common school system of Rochester, N. Y., where the family located for a few brief years, until he became apprenticed in the trade of iron molding.

Through close application he became thoroughly acquainted with every detail of the stove molders' profession, and shortly after he had graduated as a master workman the war of the rebellion broke out.

He joined the army in 1862, enlisting as a private in the 140th New York Volunteers, and participating in all the important battles of the Army of the Potomac up to the time of his capture, June 2, 1864. Mr. Cribben's regiment was one that made a record probably second to none in the army of the North and to whose tenacity on the second day of Gettysburg's fateful three days fight is due the capture and retention of Little Round Top, one of the most important of the strategic points of that bloodstained field, and no one connected with the 140th did more to maintain its prestige and credit than did Mr. Cribben. At a minor engagement at Bethes-

da Church in June, 1864, he was captured on a skirmish line which was left by Gen. Grant for sacrifice in his historic move to the left of Cold Harbor in his attempt to flank the opposing army of Gen. Lee. Mr. Cribben lay in prison at Richmond, Va., Macon and Savannah, Ga., and Charleston and Columbia, S. C., for eight months, and made his escape from near the latter place, with two others, on the 11th day of February, 1865, while being transported with other prisoners from that point to another rebel prison further north. After five weeks of as tough experience as was known to the few Northern soldiers who escaped from the clutches of the Confederates, and after having passed through many episodes and dangers, being assisted frequently by friendly negroes, who concealed him during the day and piloted him during the long hours of the night, he reached the Union lines at Vedder's Mills, Tenn., on the 15th day of March. Mr. Cribben rejoined his regiment forthwith and served out his time with it until the termination of the war, and finally reached home, having been promoted, by well earned stages, to the rank of captain. He laid down the sword and took up the pruning hook—or, more literally, the molder's rammer—and exchanged the occupation of soldier for that of peaceful artisan.

Mr. Cribben was one of the first Presidents of the Iron Molders' Union No. 12, of Rochester, N. Y., and one of the charter members of the national organization, and to his efforts, and a few other leading molders throughout the country, may be attributed the construction of that institution. He was enthusiastic in all matters connected with the Iron Molders' Union, the Trades Assembly, and the interest of labor in general, although all those who are familiar with his career are prompt to concede that he was invariably outspoken in the cause of right, whether in any particular instance the immediate interest of the employer or of the employe was to be favored or injured by the result of the decision.

One of Mr. Cribben's associates of the earlier days, who was a molder at the time he was, recently said: "Mr. Cribben was always opposed to strikes when they could be avoided, and always preferred to meet his employer who might be disposed to do anything like justice to his men more than half way, fully believing than anything that might be accomplished voluntarily on the part of the employer would prove a permanent benefit; whereas strikes, although successful, would react upon the employees when the opportunity was offered to the employer."

Mr. Cribben has expressed himself both in and out of the National Stove Association as a firm believer that education and practical co-operation honestly applied is the proper solution of the labor question. He has advocated this, and by putting it into practice in Rochester and Chicago has demonstrated the force of his argument.

He was elected to the Legislature of New York State in the year 1866, and declined subsequent nomination for that and other offices, feeling that he had had his share in political as well as military glory.

The Co-operative Foundry Company of Rochester, so well known to the trade throughout the Northern, Eastern and Western States, was organized and incorporated through the efforts of Mr. Cribben in greatest part, ably seconded by those of its President, Mr. N. Brayer.

Although not severing his connection with the Co-operative Foundry Company entirely, continuing in the Board of Directors up to the present time, he went to Chicago in 1872 and purchased a branch house, which was then being conducted in that city by the home company. He united himself there with Mr. Jas. A. Sexton, the well known and genial ex-postmaster of Chicago, and has continued since then in the same line of business, having purchased and equipped a foundry which has grown to be one of the largest in the West.

The life of Mr. Cribben has been a varied one. He has experienced more of the vicissitudes of an earthly career than often falls to mortal lot. The competence which he enjoys, the influence at his command, the esteem and respect in which he is held by his friends and acquaintances, has been secured by such honorable methods as alone can bring the highest estimation of one's fellow men.

Mr. Cribben was the first President of the Stove Founders' National Defense Association, and has continued through nine successive terms and into the tenth, although it is but fair to him to

state that he has continued in this last mentioned office only on the absolute and unanimous demand of those who formed the membership of that organization. Even those whose acquaintance with that gentleman has been confined entirely within the limits of the Defense Association, have felt that while he was persistent and unflinching in his demand that the employer should be conceded the full measure of justice and control of his own business, he has been equally tenacious in favor of granting everything that consistently could be granted to the employee, and oft defending the well established maxim that "the laborer is worthy of his hire."

W. T. Bradberry, Vice-Pres.

W. T. Bradberry, Vice-President of the Stove Founders' National Defense Association, resembles Mr. Cribben, its president, in more ways than one. In the first place Mr. Bradberry is a molder, served a regular apprenticeship; enlisted as did Mr. Cribben in 1862 to go to the front, only in a Pennsylvania instead of a New York regiment; served till the close of the war, returned home and commenced work as a journeyman at his trade and has steadily climbed the uncertain ladder of prosperity until in his particular line he is at the top as the president of the Anshutz-Bradberry Company, of Pittsburg and Allegheny City, Pa.

Like Mr. Cribben also he took a prominent part in the organization of the Defense Association in 1884 and has been its vice-president ever since, over fourteen years. He was born in Washington, Pa., in 1839, going with his parents to Pittsburg when but nine years old. Shortly after his father died leaving him the eldest of a family of three children. He learned the molder's trade with Mitchell Herron & Co., stove manufacturers of Pittsburg, remaining there until the first call to arms in 1862.

He returned to his trade in 1865 and became manager of De Haven & Co.'s stove works in 1870, remaining until 1879, when he entered the firm of H. Anshutz & Co. as a partner, which continued under that name until 1886, when Mr. Anshutz retired and the firm was known as Anshutz, Bradberry & Co. until 1892, when it incorporated with Mr. Bradberry as president. Outside of his business he is noted for the great interest he has always taken in public school matters, having for a number of years been a prominent member of the school board in his city as well as a Mason, Knight Templar, Shriner, etc. Although not a politician in any sense of the word, he yet takes a lively interest in good government matters and is now being pushed by the leading business men of Allegheny City for the position of Mayor and it is reported his election is a certainty.

Thos. J. Hogan, Sec'y.

Thomas J. Hogan, whom the stove manufacturers have selected as secretary of both the National Association of Stove Manufacturers and the Stove Founders' National Defense Association, was born April 16, 1851, at Albany, N. Y. Like others who hold official positions in connection with both associations, Mr. Hogan is a practical molder, having acquired his first education in the business with the Troy, N. Y., Co-Operative Stove Co., which he also served as secretary later on. In 1874 he became vice-president and manager of this company, remaining there until 1890, when he was chosen secretary of the National Association of Stove Manufacturers, which position he retained for one year. After this he was superintendent of the Bridge & Beach Manufacturing Co., of St. Louis, Mo., until January of the present year. It was during his first term that the arrangements were completed for the system of conferences between the manufacturers and the molders, which have resulted so satisfactorily. Mr. Hogan is happy in the possession of a number of ardent and enthusiastic friends among the stove manufacturers of the country. THE FOUNDRY feels certain that his administration of the affairs entrusted to him will be satisfactory to all concerned.

A. C. Mott, Treasurer.

There is one peculiar thing about the Stove Founders' Defense Association, and that is its wisdom in selecting the best men for the various executive positions, and then keeping them there. Mr. A. C. Mott, like Messrs. Cribben & Bradberry, was on the ground at the time the association was formed and was selected as the man to act as its banker, and has been there ever since. He was born in Glens Falls, N. Y., in 1850, and started in with Cox, Whiteman & Cox, in Philadelphia, in 1866.

He was only 16 then, but his early start

was to his advantage, and he remained right there until 1882, when on account of a death in the old concern, the Abram Cox Stove Co. was organized, of which he became Vice-President and acting President, and upon the death of Mr. Abram Cox, in 1886, he was elected President.

Mr. Pettigrew Replies.

Mr. Editor:

I am much pleased to see that my very imperfect papers on "Steel Castings" have been favorably noticed by someone, although he is even a "Mud Pounder."

I hope the gentleman noticed that the papers were dealing with the early days of steel castings, away back in the early 70's, when we were groping in the dark, trying to find out what we could do, when everything connected with the business was as it were kept a secret, and no literature of any kind treating on the subject could be had; when everyone had to profit by their own experience and even stumble onto things by accident.

Finning and brackets in those daye were unknown to us, and the object was to make the article wanted so it could be finished with as little work as possible; now finning and brackets meant a great deal of chipping and sledging, even if we had known about it, as there were no other tools connected with the foundry to do this work.

In those days the steel used in all of our steel eastings was hard or rail steel, running as high as 0.45 per cent carbon; anyone at all acquainted with steel castings will readily understand that steel containing that amount of carbon would be very hard, and any irregularity in the thickness of the metal, as for instance a heavy hub with a light thread, as in the car wheel mentioned, would very readily crack; when with a softer steel they would stand without any trouble.

We are making these car wheels now from the same pattern with a soft steel; not cutting or finning or bracketing at all, and have no trouble with them whatever; the same with gears that we used to split in the hub. With the soft steel we neither fin or split, and have no trouble with cracking, but should the mold be poured with steel containing carbon at or over 0.25 per cent shrinkage and cracks will need to be guarded against.

It must be remembered I am speaking of steel taken direct from the bessemer vessel without any chance of doctoring.

The reason we had to split gears having six arms between every two was because when split through the center of the hub the rims would be slightly flattened, caused by contraction not being equal.

I mention this to show that the per cent of carbon in the steel has a very great influence on the cracking of steel castings. I also think that the temperature at which the steel is poured has a great deal to do with this drawback we all have to guard against.

I see our friend M. P. has a most decided opinion on the top pouring of steel castings; that has been our invariable practice except with very deep work; our sand will not stand it; we have cast pinions for 9", 10", 12", 16", 24", 26" and 36" mills, which, with sinkheads, would be from five feet to 11 feet deep, all of which we pour from the bottom with good success.

There was one thing happened this week that opened my eyes on this point; one of our molders in setting a pinion flask in the pit so placed the pouring gate that the ladle on the pouring crane would not reach it, and the only thing left us was to pour straight down the sink head, which we did; it was a clear drop of seven feet; the pinion did not show a sign of cut or scab from the bottom up; the only defect was the flange on the bottom of the teeth; it was full of little shot on the outside edge.

Has our friend ever experienced this?

I think, with M. P., that it is quite possible to weld a wabbler on a steel roll; the only question in my mind is what is to be done with, and who will stand the expense of the waste steel necessary to do it; of course, I have my own opinion of this, but every shop would have to be regulated by circumstances.

Yours truly,

JOHN PETTIGREW.

Joliet, Ill.

To Prevent Gas Explosions.

R. WATSON.

Mr. Editor:

Allow me, through the medium of your valuable journal, to present to your readers

a subject well worthy of consideration, not only for them to study, but to put it into practice where there is any danger. The subject I have reference to is how to prevent confined gases that are generated when casting a mold from exploding. Although the method is old, I am sorry to say it is very seldom if ever put into practice, owing perhaps to lack of knowledge concerning the real cause of so many of these accidents. This gas or vent is very powerful when lighted, therefore the utmost care should be taken with every mold to allow it to come off freely. Of course every good mechanic will in all cases make ample provision to take the vent off, there being no given rule, consequently it is left to the molder's practical knowledge, which is entirely based on the form or design of patterns. Practically this subject is the most scientific point in all molding, therefore ought to receive more attention. The study really means to have a good open material to mold with and a sufficient number of vents to relieve the pressure of gases generated. It is impossible for me to estimate the amount of gas generated to the square inch, for the material used to form said molds differs so much that it is not the same in any two foundries. There is more gas generated in green sand molds than there is in dry or loam molds. If molds could be made without generating gas, any person with the slightest knowledge of the trade could make the most complicated casting with success. Consequently this goes to show what a prominent part it has in molding. I am compelled to say this gas is one of the greatest enemies we have to deal with, his majesty has many times absolute control over everything and in his anger does not hesitate a moment to make metal and flame fly sky high and furnish a sight that would make the finest display of fireworks blush with shame. A great number of these unfortunate circumstances might be averted if a careful study was made into the real cause, although Tom, Dick and Bob have different views as to the cause of the trouble. It is evident that a small quantity of metal poured into a pool of water will lie quiet, but pour it on damp ground and it will rebound in the air with an explosion, thus showing the power of gases. For the readers' information the following answer in the "American Machinist" was given to my inquiry. Wishing to know the properties of these gases and their explosive power, "The molds and cores contain various proportions of roots, horse dung, coal, straw, etc., all of which when decomposed by the hot metal, generate inflammable gases, in addition to which must be added steam from the moist sand which, when decomposed, will give rise to hydrogen, while its Oxygen combines with whatever carbon may be present in the material to form carbonic oxides; these inflammable gases when mixed with air produce a dangerously explosive compound. From the above it will be seen that the gases depend on the substance which enter into the mold, and little can be said of their explosive powers, but that they do explode with terrific force has been proven by sad experiences. It is in dealing with this objectionable compound that the molder's judgment and skill are frequently taxed to the utmost in order to avoid these terrible consequences." The above description will substantiate what a powerful gas we have to deal with and make molders more careful, especially when there is any danger of gas accumulating. In order to understand its cause and effects where molds are hollow, I have sketched two sections of molds that I have had trouble with, which will assist me to illustrate my object in writing this article. Fig. 1 is a part of a large chemical tank I made in Fitzsimmons' Foundry, Cleveland, O., about 15 years ago. Unfortunately the day this mold was to be cast I was absent. The foreman did not know the danger he was running to both life and limb, lighted the vent the usual way as if it was a common cinder bed in a green sand mold. The result, of course, was a terrific explosion. Fortunately all escaped without any serious injury except a few slight burns to keep them in memory of it. It is needless to say the mold was a complete wreck. Next day I found out the cause of the explosion, and explained how it was done, also giving directions to prevent these explosions. Therefore the second one was cast with success. Since that time I have heard of a number of explosions in different foundries. Therefore I have no hesitation in saying they were caused in a similar way. To prevent such explosions ought to be considered a very important matter when the

reader realizes that the safety of life and limb and the destruction of property is at stake. These explosions are caused by having hollow spaces in molds liable to be filled with this explosive gas when in act of casting; the vent pipe or outlet being smaller will not allow it to come off freely. When lighted before the air is forced out is where

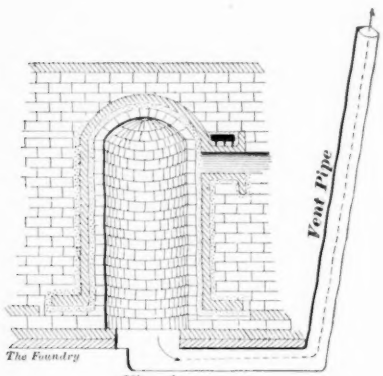

Fig. 1

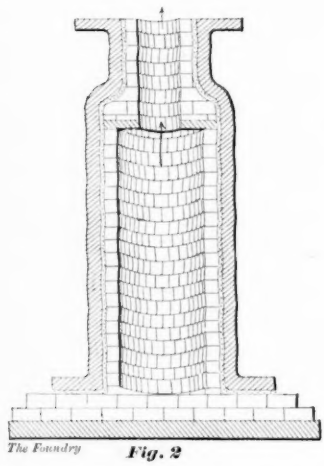

Fig. 2

the danger lies; and where there is a large amount of gas accumulated the greater the danger of explosion. A very fair sample is shown in Fig. 1, which will assist the reader to have a clearer idea of its cause and effects. In observing this sectional view of the mold, the brick work to form the core left a hollow space; therefore, the only way for the vent to get off was by the bottom of mold and up the vent pipe as shown. Now, to fully explain where the dangerous point comes in, I must call your attention to the fact that before the mold was cast, this space or hollow part of the core is full of air. This fact is a very important part in my explanation, for without this air there would not be any explosion. Now, let us suppose we have started to cast (Fig. 1); the moment we start the gas begins to generate. This gas being lighter than air, rushes to the top of the hollow part of the core, forcing out the air as it fills. When full, it will naturally run along at first on top of the air and up the vent pipe as shown at Fig. 1; if a light is applied to it at this moment the flame of the generated gas will in an instant rush down the pipe and along to the body of the mold. The hollow of the core then being full, this terrible explosive gas instantly explodes for the reason that in this case the vent pipe is not large enough to allow it immediate relief. If the vent from this mold had not been lighted till after the air had been excluded this accident would not have occugrred, for the reason that science informs us that no gas will burn without the aid of oxygen gas, which is a very powerful element and composes one of the principal and most valuable parts of our atmosphere. The safest plan in the above case is to cover the vent pipe with a sieve. If the sieve is too course sprinkle a little hay and molding sand in it, then if the vent pipe should be lighted by accident or otherwise before the air is all excluded the sieve will confine it there and the flame will not travel any farther and make your vent perfectly safe. Sometimes these hollow places can be conveniently filled with fine cinders or loose sand to avoid the accumulation of gas in a body. All that bother would be entirely unnecessary if the sieve was applied. Another sample of the power of the gas I unfortunately had was with a condenser (section Fig. 2), which also shows the brick work to be hollow in making the core. The reader will observe that in this case the vent or gas pass straight up through the core, the neck of which being smaller than the body of it, caused me to form the hollow part like a bottle as shown in sketch. Being in that shape the vent does not get off as freely as if it was straight. Lighting the vent of this core either on the top or with shavings on the bottom is dangerous if lighted too soon, or rather, I should say, before all air is ex-

cluded. The danger is in the following, lighted when the gas begins to generate, will act the same as in Fig. 1, run down all sides of the core, burn up all the gas, then instantly go out, followed with a rush of air to fill up the vacuum. This sudden current of air has a tendency to put the lighted shavings out, giving it a chance to accumulate the gas. The danger is in the second lighting of it before the air is all forced out will cause a slight explosion. Sometimes the internal pressure would be so strong that it will burst the core. The same prevention can be applied in this case, and by putting the sive on top will save danger to life and limb and the destruction of property. I trust every reader who handles the above class of work will either use the sieve or protect the vent from being lighted till after the mold is cast; by that time all air will then be entirely excluded.

Questions and Answers.

Could any reader of the Foundry tell me through the paper, a good mixture of brass for car journals. We have the old brasses to melt up. What shall we put in to serve as a flux and purify the metal?

Also, what could I put in iron metal to get all the dirt out of it, before pouring.

Could anyone tell me of a mixture of steel for colliery truck wheels. Our foreman makes his of old springs and Bessemer scrap and Hematite pig, but I don't know what weight of each he puts in; it is melted in crucibles and then softened in an oven. They wear very well, too.

J. H.

32 Shircoaks, Worksop Norss, England.

Our firm make a specialty of certain castings that are 72" long and 2¾" in diameter, these are cast solid, then a hole 1¾" in diameter is drilled through them the entire length, and polished, the outside is also turned. We have been making them in green sand, but have been bothered with the dirt, for they have to be perfectly clean. Now I wish to make them in casings in dry sand, and cast them on end. I would feel deeply indebted to you, if you could tell me of a dry sand facing, without flour, that would allow me to pour these from the top without danger of the iron causing the sides of the mould to scab. We make these castings continually, so that I would like to use the facing over again by renewing it. F. N. P.

In the shop, where I am employed, we make a tapered chilled roll for crushing clay, and are bothered by small imperfections in the face of the roll. Stones in the clay soon find the small, bad spots and wear or tear out a hole, spoiling the roll and bringing a complaint from the customer. We would like some one to tell us how, if possible, to make a perfect roller, they being poured from the top. The roll is 17 inches in diameter at the top, 14 inches at the bottom and 22 inches long, 1¼ inches thick, with a shaft 3 inches in diameter cast in roll. It has dry sand heads and dry sand core, the gas from the core being carried off through four one-inch flues. The casting is poured with iron as hot as it comes from the cupola and as fast as two one and one-quarter-inch sprues will take it, through the top head, metal striking on top of inside core; the riser sprue is one and three-quarter-inches in diameter. Mixture of iron used, No. 5 Scioto pig, or scrap car wheels, which never fail to give the desired depth of chill to the casting. We are figuring on a new chill and pouring from the bottom if we are troubled much more. W. C.

Replying to G. P., in March number of The Foundry, the best height for the charging doors in a 32" cupola is 12 feet from the bottom plate to the bottom of doors, you will get better economy in fuel and melt faster at this height than when the doors are placed lower in the cupola. The height from charging doors to top of stack depends upon the extreme height of foundry and other buildings that may be within 40 or 50 feet of cupola. A cupola 30 feet high over all is sufficient for all purposes unless the foundry or adjoining buildings are high enough to interfere with the draft before the blast is put on. The height over all will make no difference in the melting, for when the gases have passed through the stock you will not derive any more benefit if it passed through a 50-foot stack than you would in a 10-foot stack, the only way to do it is to confine or retain the heat below the charging doors.—Ed.

Replying to T. B., in March number of The Foundry, I do not think his trouble comes from the core blowing, as two-inch prints should be large enough to admit of

the vent being taken off freely, but if the blowing comes from the core, as he thinks, that can be easily overcome by using two 1-inch gas pipes perforated with about one-quarter-inch holes, then use coarse core sand and if the core is thoroughly dry there will not be any trouble from the core blowing. I think all of his trouble comes from casting the shaft in the rolls and not from the core itself, as the dampness on the shaft, I think, is what causes the trouble. C.

I see under the columns of questions and answers in the recent issue of The Foundry, a reader has a cylinder to make which has previously been made in dry sand, and wants information concerning the possibility of making it in green sand and skin drying mold.

As I have had considerable experience in skin drying work, I take pleasure in answering the interrogation to the best of my ability, and believe if he follows directions given success is certain. For facing sand, use 12 parts old molding sand, 6 parts new molding sand, 2½ parts lake sand, 2 parts seacoal, ½ parts flour. After mold is prepared as in ordinary green sand, rub on plumbago with hand and after cleaning out all superfluous blacking paint with camel-hair brush, molasses water over the whole surface of mold, except in deep flanges. Then form sheet iron so as to be 6 to 10 inches from mold and build on charcoal or wood fire and let it burn until mold has a good hard skin. J. W. H.

Replying to "A Correspondent," in a previous number, B. F. Carter says he thinks the fuel has much to do with making his iron hard as anything else, and thinks it must, and suggests that when he has his cupola lit up and before he puts on the iron that it might be a good plan to throw on a gallon on slacked lime. He suggests that care be taken to have the iron well heated, also before putting on the blast, to insure rapid melting and softer iron.

Editor of Foundry—

Having read the discussion of the Western Foundrymen's Association on the disposal of borings and turnings, in the March number of The Foundry, I offer the following from my own experience: When the last charge is pretty red, or more than half melted ,put in the cupola enough fuel to cover the surface. If coke is used, 100 to 2,000 pounds of turnings. If coal is used, the same ratio. By this method I have melted 3,000 pounds in a 32" cupola and have made 65 per cent of good clean iron by having the turnings as free as possible from the flour sweepings. The only cost was the fuel. To keep the turnings clean, have something under the lathe to catch the turnings or barings. Also have a box made of good 2" plank and placed in a convenient and dry place for the cupola man to get at it.

When the turnings reach the melting point, slack down the blast, as too strong a blast will drive it out of the cupola.

If the turnings are large chips, and clean, 75 per cent of good iron can be saved, and I consider that worth looking after in these times of much competition.

JOHN LYONS.

Enclose, please find $1 for another year's subscription to The Foundry.

Answering H. C. W., in your "Questions and Answers," would say he needs no mixture, but get an iron high in silicon. The more silicon it contains, the better it will withstand heat. It is just the iron for hot blast pipes, furnace cylinders, annealing pots, case hardening boxes, etc.

Berwick, Pa. W. Y. CRUIKSHANK.

The Malleable Iron Fittings Co., of Branford, Conn., have placed the contract for their new foundry building with the Berlin Iron Bridge Co., of East Berlin, Conn.

The Rippel Mnfg. Co., Canal Dover, O., of which E. G. Rippel, of the old firm of Rippel & King, is president, will erect a foundry at Mt. Gilead, O., 80x120 feet, an enameling building 30x100 feet, general manufacturing building 30x100 feet, and a machine shop 26x30 feet.

The Ocala, Fla., Foundry and Machine Works has purchased a large machine shop building, and is now having it enlarged preparatory to the moving of entire plant.

The Smith Scale & Foundry Co., Mississippi, noted recently, has been incorporated by C. W. Troy, J. H. Miller, W. C. Baskin, J. H. Oglesby, A. H. Smith, John Clark and others for operating a foundry, etc.

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

THE FOUNDRY

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JOHN A. PENTON,

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THE FOUNDRY is issued promptly on the tenth of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

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The Trade Outlook.

The foundry trade is holding its own nicely, although not enjoying just now anything in the way of a boom like that which gives the average pig iron and blast-furnace men cause for so much happiness.

The advance in coke and iron, together with the increase in wages in so many sections has the pleasant feature of rather encouraging foundrymen to think of raising the price of their own product.

The example being set all along the line is one they cannot longer afford to discard. Bessemer iron has increased in price 26 per cent, cotton 35, wheat 53, leather 70, refined oil 80, and hides 100, and while foundry iron has barely increased 15 per cent and is slightly behind the procession, there is plenty of evidence to show that it is rapidly catching up and that before fall may very nearly reach the figures it sold at in 1893, when the price was thought to be abnormally low, although fully $2 higher than at present. That the price of castings are not higher is of course only the fault of the foundrymen themselves ,and is caused by ignorance of the business on the part of an occasional foundrymen who make prices in an over anxiety to get business and too much willingness to believe all the stories told concerning prices quoted by the other fellow. This sort of thing in the present condition of things will shortly wear itself out or wear out some of these low bidders instead.

Concerning individual lines of foundry work, all seem to be improving, about equally the stove works at this season run largely on stock, but orders are coming fairly well, while the railroad shops are still dull, but the increased earnings of the railroads, and a better financial condition, will soon bring them into the market for equipment of all kinds.

The coke market is in an unsatisfactory condition, owing to lack of harmony among operators, but the present price is likely to be maintained.

Wages are advancing at many points here and there, and it is more than likely they will be during this year generally restored to near the figure of two years ago.

Wages Raising.

We do not suppose it would be possible

to make any accurate estimate as to the magnitude of the wage-raising movement that has been sweeping over this country during the past three months, but it must be something enormous and require an outlay of many additional thousands of dollars every twenty-four hours. The New York World some weeks ago published a list giving establishments in which an average raise of wages had been made effecting at least directly 228,000 employees and that was previous to the 10 per cent raise ordered by the Carnegie interests, estimated to effect 150,000 alone, to say nothing of those establishments that are reported in almost every issue of every metropolitan newspaper. There is no sign of our times that gives as much promise for a fair degree of national prosperity as this and we hope before the summer is passed that they may be restored everywhere to the same average as 1892.

Watch Him.

One of America's largest manufacturies of foundry facings recently made a remark to the effect that considering the volume of business done and its character, together with territory covered, that he thought it would be difficult to find one in which there was proportionately less loss than in selling material to foundrymen. That there are occasional losses of course, he conceded, but he thought that even then they were to be found principally where a business was being directed by impractical men or where harmony among stockholders or partners did not exist.

The foregoing has been suggested to us by the accounts we have recently heard of the failure of the Phoenix Foundry in Omaha, Neb. Here a man named Otis, formerly in the paper business (where, by the way, he succeeded in leaving a great many creditors), managed to become interested in a foundry business.

Thanks to the commercial agencies, probably, who knew his reputation, he did not succeed in swindling the pig iron and supply men to any great extent, but the fifty-one employees found when they got together after the close-down that they had over seven thousand dollars of wages coming to them, none of which they stand any show of getting unless a certain second mortgage, claimed to be fraudulent, is set aside. As many of these employees are sadly in want and as they had only allowed him to retain this money on the strength of gross misrepresentations, it seems to us that the foundry world should be placed on their guard as we hear he thinks of making another start.

Two Valuable Contributions.

The two very concise articles appearing elsewhere in these columns relative to the work done by the two stove manufacturers' organizations should be read and re-read by everyone interested in the foundry business. The article by Mr. L. Kahn, president of the Manufacturers' Association, appeals to every honorable sentiment and feeling of the reader in a way that cannot fail to impress a wish that the association he represents may enjoy as much prosperity as he himself could desire.

When he refers to one of its objects as being the "fostering of social intercourse, and through its influences to rob competition of the animosities it would otherwise engender," he announces a purpose that of itself alone is worthy the entire association and one that merits the support of every honest manufacturer.

Mr. Cribben refers briefly in his article to the causes that brought about the existence of the defense association, and gives a few illustrations that seem to show its workings. THE FOUNDRY does not hesitate to state that the Defense Association and those at its head have been national benefactors, and no one who has not experienced some of the difficulties connected with the labor troubles that created so much disturbance and suffering previous to its organization can appreciate the good work it has done. It is doubtful whether the stove molders, past, present or future, will ever be as much indebted to any set of men as Messrs. Cribben, Bradberry, Cox, Hogan and their associates.

Krank's Korner.

One peculiarity of the foundry is the endless varieties of molding sand employed. Some of these grades have many virtues and few faults, but the great majority of these possess the distinction of being somewhat like the bean in the shell game, in that sometimes you see them and then again

you don't, at least not in the place you expected to.

* * *

What is the first thing a molder inquires after when entering a strange shop? I hear some of you say, "Where he can get a drink," but you are mistaken. It is the sand. He has paid for some experience and information on this subject and tries to elicit whatever pointers he can from his fellow workmen, to escape paying a penalty for his ignorance in the form of a scab or a dropout.

* * *

When a foundry appears in a locality it is a strange coincidence that almost at the same time some old farmer finds that he has land that contains an abundant supply of earth having a striking resemblance to molding sand. If he can only dispose of this to the foundry, it will even at a low price pay better than raising corn and prove a continual source of revenue.

* * *

A low price appeals strongly to every foundryman and he decides to try and use this domestic article, just because it is cheap and handy. Right here is where many foundries are saving the cent and letting the dollar go, all caused by considering nothing but cheapness.

* * *

Every class of work demands sand of different qualities, therefore to use one grade of sand throughout a shop making different grades of castings cannot and does not prove satisfactory. "It is good sand, but there is no body to it" is but a fair judgment upon molding sand lacking cohesivenesss. "You have got to secure every inch of it" tells a molder the same tale. Now while thinking about it, I would like to ask a foundryman where the profit is, in using an inferior sand, and we will go so far as to suppose that he gets it for nothing, when the time is counted up that the molders spend in securing, setting gaggers and nailing this elusive material.

* * *

"It holds well, but you have got to fill it full of vents," shows another annoying fault of a molding sand. It takes time to fill a mold full of holes. It takes time to fix up the patterns that are splintered with the vent wires, and if your foreman insists on being careful and avoid injuring the pattern by gently locating it before venting, it even takes time to do this. Count up the extra time spent here and see on which side the saving is effected.

* * *

I am aware that venting and securing are both necessary on some kinds of work with any kind of sand, but it is clear that there is a limit to this also. The foundryman who tells me that he favors the home sand bank because he believes in patronizing home industries, I don't believe is acting from patriotic motives at all. I think it is because that old farmer with the big mule team has got a low schedule of freight rates. I surmise it is because this native pioneer is willing to dispose of his land by the wagonload cheaper than those people in Ohio, New York and other states who have acknowledged good grades of molding sand, are inclined to part with their holdings.

* * *

When a foundryman using an inferior sand tells me that sand is but a small item in operating a foundry, I believe he is deceiving himself. I should say that in his case it became a very great one. One of the best paying investments a foundry can make is to find and use the grade of sand best adapted to the kind of work they are engaged in. It will prove a good start toward success. It is a time saver. It is a money maker.

* * *

Did you ever notice what fine work some foundries are turning out in both iron and brass; really artistic you thought. How nice those castings peeled, also entered your mind, as you thought of that grumbling chipper of yours, who swears that he can't get your castings as clean as they should be. Do you know what is the foundation for fine castings, compliments from customers you will retain? It is good molding sand. This may mean one kind, to you it may mean another.

* * *

Don't be stingy with your molding sand

by insisting on returning all the burnt out portion to the heap. Everything wears out, so does molding sand. You cannot keep on pouring melted iron into it forever and have it retain its life. Let your molders keep their sand in good condition, and when "bad luck" strikes them you will not have to face such a charge as "burn out sand, anyhow."

The very best that can be secured in the line of molding sands, is the very cheapest.

The Evolution of a Crank Disk and Shaft.

Around a great number of operations performed in the foundry, it has been customary for ages, to throw some sort of a mysterious veil, which made molders who were in the least inclined towards superstition, regard these as being only accomplished persons having supernatural insight and intelligence, instead of being subject to physical laws and definitions.

The foundry, too, has in the past furnished more than its share of members of that unnamed tribe of humans who consider it dishonest to appropriate the benefit of others' experience, forgetting that they themselves have to a great extent escaped failures at the expense of others; yet there are foundries at the present time which would look upon the divulging of some of their operations as being outright robbery, and would deal summarily with the offender.

If such establishments have any claim to originality, let them apply for protection to our patent laws. The Builders' Iron Foundry, of Providence, R. I., have set an example, or a precedent, in publishing through the mechanical press, descriptions of the building of the rifled mortars for the United States government, that is worth following by others. Let things that are dark and tricks that are vain in the foundry, be held up for public scrutiny and research, and let those who are able to improve and do better, do so.

Every machinery molder knows what an engine crank is, and most of them are familiar with those which are in the form of a disk, used for a large number of engines. As ordinarily made, two spaces are cored out, and afterwards finished, one for the reception of the crank pin and the other for the shaft, both of which are pressed in under pressures which vary from what the management believes sufficient, to the limit of the strength of the metal.

A well-known automatic high-speed engine contains two of the disks shown in plan and section, Figs. 1 and 2. Being a high-speed engine the stroke is necessarily short, leaving but a small amount of metal between crank pin and shaft, often fractured in pressing in either, and although this would sometimes escape immediate detection, yet it was a source from which trouble could continually be expected. These disks were made as shown at Fig. 3, the disk being cast-iron with a steel shaft pressed in.

At Fig. 4 is shown an advancement, consisting of a cast-steel disk in place of cast-iron with a steel shaft pressed in. That this arrangement entails an extra expense is plain, but better results were, of course, procured, since steel has a greater tenacity.

Fig. 5 shows the next step taken to reduce the cost of production, where a cast-steel disk with a cast-steel shaft, both cast at one operation, displaces other forms. It is apparent, that a considerable saving is here effected, for the labor of fitting the disk and shaft and pressing them together is entirely dispensed with.

Fig. 6 shows to what stage of development this atricle has reached. Both disk and shaft being made of cast-iron, and cast together at one operation with a steel center placed in center of shaft and disk and cast in s shown.

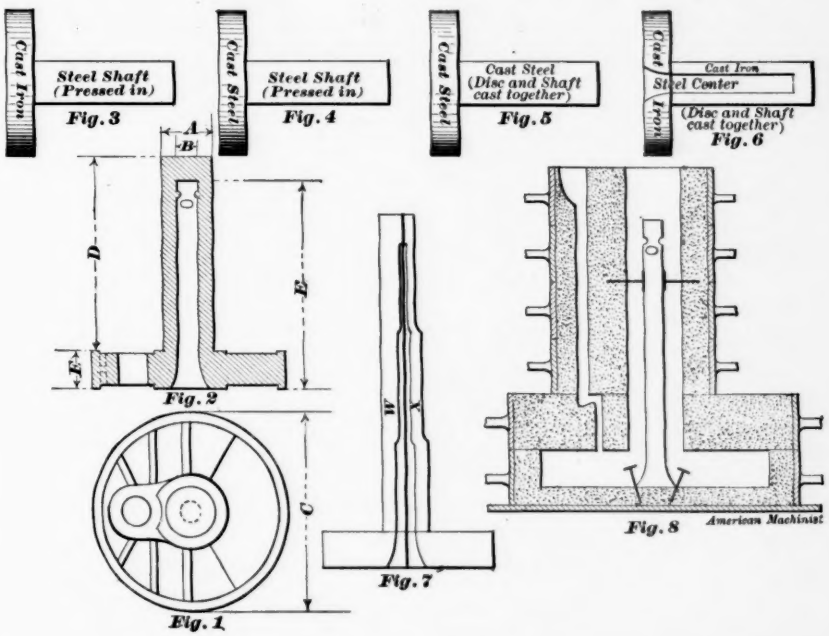
In the fall of 1893 Messrs. Ide & Son cast three disks and shafts for experimenting, one of cast-iron solely, one of the same material, with a 1½-inch hole cored through the center of disk and shaft for its entire length, and one as shown at Fig, 6, with a 2½-inch steel center. Upon testing these the latter was found to possess the greatest strength. It would seem as if this conclusion could have been formed beforehand, for the diameter of the shafts being identical, the one cast solid was stronger than the one with a 1½-inch hole cored through it, because it contained a greater cross-sectional area; the one with a steel center cast through it was stronger than the one cast of nothing but iron, by at least the difference in strength between a shaft of steel 2½ inches in diameter, and a shaft of cast-iron of the same diameter.

What theory said was true, also proved in this case true in practice, and although this could here be omitted, yet I feel somewhat like the fellow writing a biography, bound to keep close to the facts and occurrences.

The extraordinary use to which cast-iron is put in this case, is so much out of common practice that I could not very well avoid being interested in its development, especially so since it furnished the iron foundry, connected with the works, an extra amount of work, for which us molders were thankful during the dull period, then at its hight.

Salisbury, old car wheels and old crank disks. What kind of iron follows this special charge is mentioned in each case, thus on January 9th, 600 pounds of Hinckle, and on January 12th, 1,000 pounds of Warner constituted the following charge. (This is mentioned here to show what kind of iron, if any, mixed with the special charge, for in running a heat, and a small one at that, it is a hard matter to keep the different charges from mixing.)

It will be noticed that on several occasions the shafts are marked "special." This only implies that the length of shaft and



The iron is melted in a 34-inch Colliau cupola, in all cases at the first of the heat, as the iron is of a hard nature and melts more rapidly, that is, melts at a lower temperature than the softer brands of common iron, thus preventing to a great extent the softer brands in the following charges from being mixed with those intended for the disks. To secure as uniform results as possible, the iron for this purpose is at each heat tapped out in one ladle, and while there may be variations in the quality of the metal, still all those shafts cast at any one heat, will be as near alike as it is possible to make them.

But three kinds of iron are used, or rather supposed to be used, for these disks, viz.: center differs from the standard size, and the dimensions are quoted in each case. When cast these shafts appear as at W, Fig. 7, when finished somewhat like X, same figure.

The plan of molding these shafts may be seen at Fig. 8. This insures a solid shaft by casting it about 6 inches longer than wanted, and necessitates no feeding. This point will be appreciated by foundrymen who know how difficult it is to get a lot of castings fed solid, when help is wanted all over at once.

A peculiar phenomenon was observed in connection with the casting of these shafts. Upon one occasion when two of these were wanted of extraordinary length the superintendent, Mr. Richards, thought it advisable

to heat the centers as hot as possible in the brass furnace just previous to casting. After being poured the metal refused to remain quiet in the top part of the shaft, and a large amount of gas was seen to escape through the molten metal. Feeding rods were employed and hot iron supplied to keep the heads open as long as possible, but after all the care taken the shafts were found to have several small cavities just above the steel center. As no trouble had been experienced on this account, when the centers have been used without heating, this can only be accounted for by supposing that the unification of the cast-iron and steel was attended with some chemical change, resulting in gas being produced, which escaped through the liquid iron as long as possible.

One thing noticed, was that the union effected between the steel center and the cast-iron surrounding it was more perfect

Charge of Iron for Disks and Shafts.

Date of Heat.	No. of Shafts.	Size of Engine.	Car Wheel, lbs.	Salisbury, lbs.	Old Crank Disks, lbs.	Charge Following Special Mixture, lbs.	Transverse Strength of Test bars in lbs. 1" in Square Tested. 12" Between Supports.	Remarks.
Nov. 23, 1894..	3	14x14	1,500	900		Old Crank Disks, 600	3,300	
Dec. 8, 1894...	4	12x12	1,200	1,100		Hinckle, 800	1,900 and 2,100	Test bars defective.
Dec. 12, 1894...	1	12x12						
	1	10x10						
	1	8x10	900	1,300		Hinckle, 600	2,875	Length of special, 8x10 shaft, 33". Length of steel center, 26".
	1	8x10 Spec'l.						
Dec. 26, 1894...	2	14x14 Spec'l.	1,000	1,000		Hinckle, 400	2,650	Length of shafts, 36". Length of center, 31".
Dec. 29, 1894...	1	12x12 Spec'l.						
	1	12x12	950	1,250		Hinckle, 600	None.	Length of special shaft, 54". Length of special center, 48".
	3	10x10						
Jan. 2, 1895....	5	6x 6						
	2	8x10	900	1,400		Warner, 1,200	2,800	
	2	10x19						
Jan. 9, 1895....	1	10x10						
	2	8x10						Length of 10x10 shaft, 18".
	1	10x10 Spec'l.	900	1,400		Hinckle, 600	None.	Length of 10x10 center, 40". Length of 8x10 shafts, 54".
	2	8x10 Spec'l.						Length of 8x10 centers, 45".
Jan. 12, 1895...	2	8x10 Spec'l.						
	3	10x10		700	1,500	Warner, 1,000	3,100	Dimensions of 8x10 special shafts same as given in heat of Jan. 9th.
	1	6x 6						
Jan. 18, 1895...	2	12x12	1,300	1,600		Old Cylinder Iron (hard), 500	2,950	Length of special shafts, 60". Length of special centers, 54".
	2	12x12 Spec'l.						
Feb. 6, 1895....	3	14x14	1,200	1,200		Warner, 900	3,125	
Feb. 13, 1895...	1	14x14	1,000	1,200		Warner, 800	3,700	
	2	12x12						
Feb. 16, 1895...	2	10x10						
	3	8x10	750	1,600		Warner, 800	3,000	Length of special shaft, 54". Length of special center, 48".
	1	8x10 Spec'l.						
Feb. 23, 1895...	4	12x12	600	1,300	600	Old Cylinder (hard), 600	3,400	
Feb. 27, 1895...	2	10x10			600	Warner 600	3,250	
	2	12x12	800	1,000				

than those which were cast without heating the center. In this case the defective part was turned off, and a new end burned on, just as is practiced with rolls. Some of these extra long shafts may be seen on engines at Daniel Scotten & Co., Detroit, Mich., also at the Chamber of Commerce, same place.

Are these shafts solid? many with undoubtedly ask, and anticipating such a question, I will say that of those defective shafts, which have been broken up, the steel center has readily left its cast-iron covering, showing that no actual union existed between the two, that it is simply a case of one substance being covered with another. Many even hold the view that this cast-iron covering does not surround the steel center firmly, but that a space, though a very small one, exists between them. This theory is accounted for thus, when the cast-iron enters the mold and surrounds the steel center, a part of it on coming in contact with the cold steel becomes immediately chilled and remains so indefinitely. The steel center is by this time becoming heated and expands, forcing outwards this chilled portion, which is no longer in a molten state. When the steel center starts to cooling it shrinks away from this chilled portion, and if the cast-iron which remains between the center and the surface of the mold is unable to force together this chilled portion or possesses sufficient elasticity to avoid this, the center will practically be loose; whether such is the case or not can be left for decision to anyone who takes an interest in these matters, with the knowledge that there is always somebody to be found on all sides of a question.

The strength of test pieces cannot be taken as an exact indication of the strength of the shaft. It is possible to make a test piece that shall be stronger than the shaft, but it will more generally be found that the shaft possesses a proportionately greater strength than that indicated by the test piece.

The reason for this discrepancy between the two is the fact that they are cast under different conditions. By the chilling effects exerted by the steel center the iron in the shaft becomes of a different character. It will thus be apparent that the statement regarding difference in strength between shaft and test piece is correct, for a weak iron would be made stronger by chilling, while an iron that possessed the limit of strength would be weakened in the same manner by an increase of combined carbon.

It may be said to be a very delicate matter to say what kind of cast-iron is most suitable for this purpose, since shafts of different diameters will each require a different kind of iron in order that their strength and wearing qualities may be nearly alike, for a mixture suitable for a shaft of small diameter would be too soft for a larger one, and a mixture satisfactory to the latter would be entirely too hard for the former.

In the table will be found a table of dimensions of different shafts and centers, a record of shafts cast for several months, with mixture of iron, strength of test pieces, and other matter of an interesting nature.—American Machinist.

Pittsburg and Vicinity.

There has been an increasing activity in the crude and finished lines of the iron and steel markets since our last report. Manufacturers of all kinds are able to see their way more clearly into the future and they are laying their plans and broadening their fields accordingly. In southern districts, furnace product is being sold at a slight advance, and operators think they can sell all they make at these stronger figures. Northern furnace men are also of the same opinion and a stronger demand in all lines may be expected within the next six or eight weeks.

Manufacturers who speak of the future of prices are slow to say that an advance is probable. The general impression is that most of any advances found possible this summer or fall will be absorbed by higher cost. In railroad circles, there is still a tendency to hold back, and they seem determined not to run into expenditures until receipts warrant. The moderate improvement so far recorded does not warrant any more than a hand-to-mouth restoration of equipment. The improving tendencies at work are stimulating a spurt of organization for better prices. The wages question will not bring any serious complication with it this year.

The market improvement in the iron and steel trade, that has been so manifest for

the past few weeks, is not only maintained, but there has been a decided though small advance in prices. The market can be said to be in a healthy condition, most of the chief iron and steel markets showing this to be the case. Bessemer pig iron is a great deal higher as are nearly all grades of foundry irons. The mills and furnaces in and near Pittsburg are quite well sold up, or at least orders for a large portion of their output are placed, so that there is no anxiety or rush to secure additional orders.

No. 1 Foundry	$11.00@11.50—cash
No. 2 Foundry	10.00@10.50—cash
Bessemer	12.00@12.25—cash
Charcoal Foundry No. 1	16.50@17.00—cash
Charcoal Foundry No. 2	15.50@16.00—cash
Charcoal cold-blast	22.50@23.00—cash

The cast iron pipe market is in a fairly good condition, with slightly advanced prices prevailing.

Rolling mill castings are about in the same demand with prices still ruling as follows:

	Cents per lb.
Chilled rolls, up to 12" diameter	3¾
Chilled rolls, over 12" diameter	3¼
Sand and homogeneous steel rolls and pinions up to 12" diameter	2½
Over 12" diameter	2
V-tooth pinions, additional	¼
Housen and rolling mill castings not otherwise specified	2
Spindles and coupling boxes	1¾
Squeezer castings	2
Squeezer pinions and wheels	2¼
Spur and bevel wheels, large	2½
Spur and bevel wheels, small	3 to 4

Copper—There is a fair demand being experienced for this product, with prices ruling at 10½@10⅝c for casting.

Pig Tin—Sales have been made at 15½@16½c during the past week, but these have not been of large sizes.

McVey & Walker, founders, of Braddock, have begun the erection of a plant for the manufacture of enameled bath tubs, linings and furnishings.

James G. Neil's foundry, Smallman street, was destroyed by a fire a few days ago. The fire broke out in the core drying kiln, causing a loss of nearly $3,000.

The Baker Forge Company, of Ellwood City, has just completed the erection of an addition to its plant, which will serve to increase the capacity of wagon hardware and other forgings.

The first finished work from the Pittsburg Architectural Iron Works at Canonsburg was turned out. It was a large order of steel columns and girders for William Trimble & Co., of this city.

By an explosion of gas under one of the furnaces in the newly erected enameling plant of Jas. McNeil & Bro., of this city, a loss of $1,500 was sustained. The plant was built for the purpose of enameling the pipe to be used in the Allegheny City water works.

The Leechburg Foundry and Machine Company has received an order from the Star Tin Plate Company (Mackintosh, Hemphill & Co.), for two Mesta patent pickling machines and for tin plate machinery for the Licking Rolling Mill Company, of Covington, Ky. The Stinkney Iron Co. has also ordered a Mesta machine.

The Trethewey Manufacturing Company, of this city, has just leased the plant of the Pittsburg Tool Steel Company, located at Greensburg, and will operate it in connection with its present plant, in the manufacture of all kinds of tool steel. The company also controls the celebrated Damascus steel refining process and will furnish oil bit and jar steel, dies, etc., made by this process.

The Apollo Iron and Steel Company intends building an entire new works and new town at Vandergrift (formerly Townsend station), West Penn Railway. It is the intention of the company to have a large open-hearth steel plant, blooming mill and continuous bar mills. Eight new sheet mills will be ready to run in a few months, and by degrees the extensive mills, foundry and machine shops will be removed from Apollo.

The Stow Flexible Shaft.

It is said that the Stow flexible shaft was originally patented by M. N. Stow, President of the Stow Mnfg. Co., for dental purposes. This was twenty-five years ago, however, and during that time its use has become almost universal wherever power is used for drilling, lapping ramming, grinding or polishing. Whenever on account of weight or position it is desirable to take the tool to the work, instead of the work to the tool, it will be found invaluable for any of the above purposes.

Our illustration shows its use in a foundry

where by the aid of emery wheel castings can be smoothed over their entire surface and what it ordinarily required hours to do by the old method of hammer and chisel, may by this method be more quickly and perfectly done by power. For dressing off large casting and drilling holes quickly where needed, it has been found to save its cost in a few jobs. It can be furnished cheaply and promptly by the Stow Mnfg. Co., Binghampton, N. Y., who also send a handsome catalogue upon request.

Books, Exchanges, Catalogues.

The statement will be received with satisfaction that General Forsyth's "A Frontier Fight," published in Harper's Magazine this month, is the forerunner of a number of similar stories, written by heroes of the army and navy, and recounting personal experiences of the most stirring order, soon to appear in the Harper periodicals.

Does yours leak? If so, write Smith's Pattern Works, Akron, O., for circular entitled "Little Leaks."

Little and big leaks calked for the asking. Circulars "How to Do It" mailed free on application.

The above does not refer to steam boiler, sailing vessel or roof, but to a matter of importance to every pattern maker and foundryman, and is simply Mr. Smith's unique way of attracting attention to his neat circular describing his specialties.

Among the masterpieces of the bronze-worker which have come from that olden time to us are great bronze battle-horns, called by the Danes lur. These are truly gigantic. Twenty-three specimens have been found in Denmark, all in peat bogs, and most of them in pairs. For years a dozen of these lurs hung in the museum silent. Recently Dr. A. Hammerich secured permission to study them as musical instruments and to test them. Finally, these were played upon before a large and enthusiastic audience, the king himself being present. Only a few times since have these old horns been sounded, but on one of these occasions we had the good fortune to be present. Two players from the opera were the performers; the court of the museum was filled with hearers. Wonderful, is it not, that horns two thousand years old, buried for long centuries in peat bogs, should, after this long silence, still be capable of giving

out clear, ringing—even sweet—tones?

The conditions in which these lurs are found are most suggestive—always in peat bogs, usually in pairs. This could not be the result of accident. Other objects are found purposely laid away in the same manner; thus ten bronze hemispherical plates were found at one spot; nine fine bronze axes, all of one form, at another. Similar clusters of celts, spears, etc., are not uncommon. On one occasion about one hundred miniature boats of thin beaten gold were placed in a vessel and buried; such occurrences are not completely understood. Dr. Sophus Muller believes that such purposely buried or sunken objects are ex votos.—From Archaeology in Denmark, by Prof. Frederick Starr, in The Popular Science Monthly for May.

The Philadelphia Foundrymen's Association at their last meeting listened to a paper by Thomas D. West on the subject of "Natural Draft Cupolas." There will be no July meeting on account of the hot weather.

The Foundry Outfitting Co., of Detroit, report that they have received orders for a complete outfit for the new Leland & Faulconer Mnfg. Co.'s foundry in this city. The order included Crane, elevator, cupola, ladles, blower, fire brick, molding sand, snap flasks, sand sifters, etc.

New Foundries.

The Warren Foundry & Machine Co., at Fall River, Mass., will enlarge their plant.

The Southern Foundry & Machine Co., at Fredericksburg, Vo., will enlarge.

The Lowell Machine Shop & Foundry, at Lowell, Mass., is enlarging their foundry.

Milligan's Foundry, at Pottston, Pa., recently burned, will be rebuilt.

Ehret Bros., are enlarging their foundry at Belleville, Ill.

J. P. Lowell & Co. will carry on a foundry business in Chambersburg, Pa.

The New Doty Mnfg. Co., at Janesville, Wis., are erecting a large foundry.

Richard Roberts & Son are erecting a new foundry at South Delta, Pa.

The Phoenix Foundry is a new concern at Galena, Kansas.

The Kelly & Jones Iron & Brass Mnfg. Co., at Greensburg, Pa., will spend $10,000 on improvements this summer.

The Greenmount Iron & Mnfg. Co. is a new corporation at Baltiore, Md. They will do a general foundry business.

Mackenzie's foundry, Trenton, N. J., will be enlarged by the addition of a molding room, 47x112 feet.

The Enterprise Brass Foundry & Mnfg. Co. is a new incorporation at Cleveland, O. Capital, $10,000.

The Model Iron Works, of Wichita, Kas., contemplates establishing a foundry at El Reno, Oklahoma Territory.

The A. Y. McDonald & Morrison Co., of Dubuque, Ia., will build a new foundry 100x266 feet.

The Erie Foundry Company has been incorporated at Rochester, N. Y. Capital, $12,000.

C. J. Sherwin and W. H. Miles have rented the plant of the Muskegon Machine & Foundry Co., at Muskegon, and intend operating it.

The Central Oil, Gas Stove Co. have purchased the Geo. F. Smith Purifier Co. plant at Jackson, Mich., and are going to operate it in the manufacture of all kinds of gas and vapor stoves.

E. Van Winkle formerly president and general manager of the Van Winkle Gin & Machine Co., of Atlanta, Ga., will go into business for himself making cotton machinery.

Terstegge, Gohman & Co., New Albany, Ind., have prepared plans for the erection of an addition to their stove foundry. The new building will be of brick and have dimensions of 90x132 feet.

Among the Foundries.

The Sioux City Stove Works are for sale.

The Sussex Foundry at Sussex, N. B., will be torn down and a larger one built.

The Great Western Mfg. Co., of Leavenworth, Ks., manufacturers of mill machinery are very busy.

The foundry to be erected in Clinton, Ill., will be erected by Ransomer & Hendricks and known as the Clinton Foundry and Machine Works.

C. Macardell has purchased the Steenburgh foundry at Goshen, N. Y.

Baughman Bros. have sold their foundry at Albion, Ind., to Hoffman & Co.

B. Strait has bought the Smith foundry at West Stockholm, N. Y.

The Geauga Foundry Co., Plainsville, O., have increased their capital stock from $50,000 to $75,000.

The Falls Rivet Co., Cuyahoga Falls, O., have raised the wages of all employes 10 per cent; 500 men are effected.

There is some talk of starting up the Bain Stove Works, at Charleston, Ill. It is believed the money is available. What is needed is an up-to-date man to run it.

The new foundry being erected for the Wm. Wharton, Jr., & Co., Philadelphia, is being built to carry on the business formerly conducted by Mr. James Moore as the Bush Hill Iron Works. The former company having purchased it, together with drawings, patterns, etc. It will be known as the Philadelphia Roll and Machine Co.

J. E. Greus and Clarence Shank, two young moulders, have recently completed the erection of a foundry and machine shop for the purpose of carry on a general foundry business at Roanoke, Va. As both are good, practical moulders, we predict a bright future for them.

Robert Field, formerly traveling salesman for Lee, Chamberlain & Co., St. Louis, pig iron merchants, has resumed his position with this house, and will again travel in the interest of this company. Lee, Chamberlain Co. are handling the entire production of Lady Ensley furnace and are also agents for the Rainey Connellsville 72-hour coke.

The Smead foundry, at Toledo, has passed through some strange experiences in the past few years. Recently C. W. Everett bought in the works and now Col. Smead has leased them in the name of his wife, and contemplates the manufacture of his well known specialties on as large a scale as ever.

The Chattanooga Car & Foundry Co., Chattanooga, have a very large contract for tablets to be erected in the Chickamauga-Chattanooga National Park. They are about 3x4 feet and are inttended to mark the location of the various brigades, divisions and corps' in that famous fight.

As an evidence of the deterioriation of values in some sections of the country, it might be remembered that on May 24th, the well-known Swampscott Machine Co.'s plant at Exeter, N. H., consisting of spacious shops and foundries, with engines, boilers and main shafting and 10 acres of land, traversed by the Boston & Maine tracks and fronting on the navigable Squamscott river, was bought by A. P. Hunt, of Portland, Me., for $4,100.

Personal.

George F. Crivel—nearly every foundryman knows George—is to be married June 26 in Indianapolis, Ind.

Mr. George Weaver has been appointed foreman of the foundry of the Middleton Car Works, Middleton, Pa.

Mr. H. F. Frohman, secretary of the S. Obermayer Co., is now located in Chicago, in charge of the Chicago mills and business of that concern.

Mr. Henry Gretener, a well-known mechanical engineer, formerly with Pedrick & Ayer, of Philadelphia, has become associated with the Foundry Outfitting Co., of Detroit, and will fill the position of secretary.

Fires.

The L. Wolff Mnfg. Co., Chicago, suffered from a $5,000 fire, May 22.

The St. Albans Foundry Co., at St. Albans, Vt., have suffered from a $5,000 fire.

James G. Neil Co.'s foundry, at Pittsburg, transportation facilities.

March, Brownbach & Co.'s foundry at Pottstown, Pa., suffered from a $50,000 fire June 7th.

The Aetna foundry, at Springfield, Ill., was totally destroyed by fire, May 21st. Insured for $7,500.

The foundry at Conneautville, Pa., owned by H. A. Smith, of Smithton, Pa., has been burned. Loss, $5,000.

The foundry and machine shop so well known as the Oille works, at St. Catherines, Ont., was entirely destroyed by fire, May 6th. It was owned by Hogan & Legatt, of Montreal, and operated by Wright & Cunningham.

burned May 22. Loss, $4,000.

The foundry is well located as regards

The Delphos Foundry & Furnace Co., of Delphos, O., lost their foundry by fire, June 3. Loss, $2,700; no insurance.

The foundry of the Indiana Machine Works, at Fort Wayne ,Ind., was entirely destroyed by fire, May 29. Loss, $6,000; insured.

The pattern shop connected with Blaikie's foundry, at Sarnia, Ont., was burned May 24th. Loss, $5,000; insurance, $1,600.

The Bagley & Sewall Co., of Watertown, N. Y., have begun the erection of a new foundry. It will be 75 feet wide, 200 feet long, and 40 feet high, and it is expected will be one of the most perfect plants in New York state.

Among the new manufacturing concerns that have been recently established in the great mining center of Pachuca, Mexico, is the Pachuca Foundry and Machine Shops, limited. This company has a capital stock of $100,000 and makes a specialty of mining machinery.

Casting up to ten tons in weight can be turned out and all the appliances of the concern are first-class. In the pattern shop are the latest improved wood-working machinery. The foundry shops have a floor space of 190x50 feet and the machine shops a floor space of 175x40 feet. The forges are eight in number and occupy a floor space of 60x100 feet. The large concern covers a space of 5,000 square metres.

Mr. G. E. Dingey is general manager of the foundry. He is one of the most capable and experienced machine men in Mexico. He was formerly connected with the Colorado Iron Works, of Denver, Colo., and previous to that time he was with the Truro Foundry and Engineering Works, of Truro, Cornwall.

The Market.

The Iron Age says the past week has been one of the most stirring in the history of the iron trade for many years. It presents an unbroken record of advances all along the line, and few are left who would characterize the upward movement as a "soda water rise." The most extraordinary thing is that the upward tendency has developed so fast without the powerful aid of heavy purchases from the principal consumers, the railroads. It is true that the railroads have been buying a little more liberally, but it is certain, too, that they have not yet taken hold as they will if finances get into better shape and crops do better than the earlier scare stories would indicate. This may make this summer an exception to the usual dullness of that season.

The central west leads in the advance and the boom feeling prevailing there seems justified, because there is practically no reserve capacity either in furnace plant or steel works. It is really only in Chicago that such a reserve does exist anywhere west of the Allegheny mountains. It is very different in the east, and so fas as pig iron is concerned in the south, and notably in Virginia.

In foundry iron there have been heavy sales in Cincinnati. The southern furnaces have advanced prices 25 cents per ton, and in Chicago local foundry iron is up 50 cents. The market is stiff and is rising in the east. The announcement is made that the Tennessee and Sloss companies will establish a joint sales agency. Other Birmingham companies are talked of as being ready to join the movement, but in the case of at least one of them no credence is attached to this report.

We quote $12.50 to $12.75 for No. 1; $11.50 to $11.75 for No. 2, and $10.75 to $11 for No. 2 plain, and $10.25 to $10.50, Northern plain, and $10.25cmfemehtmthemachtaroho plain, tidewater delivery. Southern iron, same delivery, is selling at $12.25 to $12.50 for No. 1; $11.50 to $11.75 for No. 2; $11.25 to $11.50 for No. 3; $11.25 to $11.50 for No. 2 soft, and $11.50 to $11.75 for No. 1 soft foundry No. 4 (foundry forge) is $10.75 to $11.

CHICAGO PIG IRON.

Manufacturers of local coke iron advanced their prices 50 cents during the week, as was intimated in our last report. Business was checked to only a slight extent by the advance, a considerable number of contracts having been placed at the higher rate. Consumers who are endeavoring to place orders for long delivery are now being quoted an advance of 25 cents for each quarter of the year, making a price of $1 per ton higher for the last quarter than current rates. The

indications point to a scarcity of pig iron in the late summer or early fall, which is a contingency that was not regarded as possible only a few weeks since. Southern coke iron has been marked up; also the Sloss Iron & Steel Company are now out of the market, having all the orders they care to take for the present. Only one large southern company is in condition to take business, and it is quoting higher prices for future delivery. Buyers are showing a disposition to speculate on the future and are endeavoring to place contracts considerably in excess of what it is believed they will require. A good demand has been felt for Lake Superior charcoal, but in small lots. Quotations are as follows, for cash:

Lake Superior charcoal.....	$13.00	to	$13.50
Local Coke Foundry, No. 1..	11.00	to	11.50
Local Coke Foundry, No.2..	10.75	to	11.00
Local Coke Foundry No. 3...	10.25	to	10.75
Local Scotch, No. 1.....	11.00	to	11.50
Ohio Strong Softeners, No.1.	13.00	to	13.25
Southern Silvery, No. 1.....	12.25	to	12.50
Southern Silvery, No. 2.....	11.75	to	12.00
Southern Coke, No. 2.....	11.00	to	11.25
Southern Coke, No. 3.....	10.75	to	11.00
Southern, No. 1 Soft.....	11.00	to	11.25
Southern, No. 2, Soft.....	10.75	to	11.00
Alabama Car Wheel.....	16.00	to	17.00
Jackson County Silvery.....	15.00	to	15.50
Other Ohio Silvery.....	14.25	to	14.50
Coke Bessemer	12.00	to	12.50
Coke Malleable	12.00	to	12.25
Spiegeleisen 20%		to	26.00

CONNELLSVILLE COKE.

The Coke organization is still in process of formation, and from the fact that a large producer is erecting new ovens and is also reported as buying coke, it is evident that there is faith in some quarters, at least, that it will go through. While it is generally expected that Furnace Coke will be $1.50 per ton, or higher, after July 1, it is nevertheless a fact that contracts for the last half of the year have been made at $1.35 and in one or two cases at a slightly lower figure. These contracts contain a labor clause providing for an advance of 2 cents per ton in Coke for every advance of 1 cent over 90 cents for mining 100 bushels of Coal. For the week under review there were 12,991 ovens in the Connellsville region active and 4843 idle, the estimated production for the week being 126,320 tons, a slight decrease over the previous week.

C. F. Hall, who for many years conducted a foundry at Port Schuyler, N. Y., died at his home in Troy, N. Y., May 5th, aged 75 years.

NOTICE.

Advertisements inserted under this head for 25 Cents a line each insertion.

WANTED—Position as foreman, superintendent or manager of foundry. Twenty-five years' experience on all classes of gray iron casting; 15 years' experience in above positionsQ. References. Correspondence solicited. Address N. E., care of Foundry.

WANTED—A situation by a good, temperate, industrious molder, capable of taking charge of a foundry, employing from 5 to 6 men; no objection to a small foundry employing only 1 or 2 men. References. X., The Foundry.

WANTED—To sell one-quarter or one-third interest in foundry and machine works to practical molder, who can take charge of and operate that part of the business; $1,000 cash, balance in installments. H. H. Mason, Mt. Carmel, Ill.

FOUNDRY and machine shop for sale, cheap. Wishing to retire from active business, I offer my entire plant at a great bargain. The plant consists of a machine shop 36x60 feet, 3 stories high, with complete set or iron and wood-working tools and machinery; foundry 60x80 feet, with first-class equipment; fire-proof pattern building, 30x30 feet, 3 stories high, containing a large stock of very desirable patterns; also blacksmith shop, storehouse, japaning building and office building. Both steam and water power. Just the plant for manufacturing hardware specialties. Address Huntington Beard, Fayettville, N. Y.

WANTED—A situation as foreman of iron foundry by an experienced man, who is at present foreman in a shop giving employment steadily to 90 molders, which position he has filled satisfactorily for three years. Best of references furnished. Address Foreman, No. 229 LaSalle street, Chicago.

Obituary.

Mr. George H. Jones, who died at his home in South Union, Maine, May 5th, had been 50 years one of the leading citizens of that town. Mr. Jones was the proprietor of the iron foundry and machine shop, and besides being prominent as a business man, had taken an active part in town affairs. He had served a number of times as selectman, besides serving his fellow townsmen in other capacities. Mr. Jones was a native of China and was 78 years old.

G. N. Crumbach, President of the Crown Smelting Co., Chester, Pa., committed suicide, May 28th. Business worries and poor health being the cause.

Officers of the W. F. A.

John M. Sweeney.

J. M. Sweeney, the newly elected President of the Western Foundrymen's Association, is a native of Wheeling, W. Va., where he was born July 10, 1851. After graduating from Washington and Jefferson College at Washington, Pa., Mr. Sweeney entered the general foundry and machine business carried on by his father, which was known after under the name of A. J. Sweeney & Son.

He was always noted for being original and aggressive, and many of the largest furnaces and mills in not only that but distant parts of America were erected by him. He also gave the matter of marine engines considerable attention, and built a great many for the boats plying on the rivers of that part of the country. Aside from this, he found time to give electrical matters much care and thought, and was interested in the electric light and electrical street railway in Wheeling, the latter being said to have been the sixth in the United States. In 1892 their works were removed to Harvey, Ill., a suburb of Chicago. He takes a great interest in matters pertaining to the foundry business, and has been prominent in the affairs of the Foundrymen's Association since its formation.

A. W. McArthur.

A. W. McArthur lives at Rockford, Ill., eighty-six miles from Chicago, and the measure of interest he takes in the affairs of the Western Foundrymen's Association is shown by the fact that he never allows any trivial matter to prevent him riding eighty-six miles to attend its meetings. By the same method of reasoning we are able also to draw some conclusions concerning the gentleman's energy, ambition and desire for information. Of Mr. McArthur's life we know but little beyond the fact that he was born in Joliet, Ill., in 1863; went to school in Rockford and later on graduated from the Northwestern University. Not satisfied however, with the start all this knowledge gave him, he studied engineering for some time at the famous Worcester, Mass., Polytechnic Institute, and since then he has been connected with the engineering, foundry and machine business, being at present President of the Rockford Foundry Co.

S. T. Johnson.

S. T. Johnston is the name of the good-looking Secretary of the Western Foundrymen's Association. When asked for a few lines concerning his eventful career, he replied by saying he had none—only knew from heresay that he was born in Glasgow, Scotland, in 1866, and knew as a fact that he lived there until about 7 years ago, when he came to America.

On his way to the far west he stopped in Detroit, and became hypnotized by its beautiful avenues, broad river and shady parks. Shortly afterwards he entered the employ of J. H. Whiting, his first and only "boss," until he got married about five years ago to a Scotch lassie, and who, together with S. Johnston, Jr., bosses him at home. He likes this country; is glad he came here, and, we might say, he has hundreds of friends who feel likewise.

He is always good-natured ,especially when selling Whiting cupolas, cranes, ladles, etc.

O. T. Stantial.

O. T. Stantial, the association's newly elected Treasurer, was born in 1863 at Melrose, Mass., and received his early education at the common schools and later at the Massachusetts Institute of Technology, graduating in 1885, receiving his degree as mining engineer and metallurgist. For three years he was with the Illinois Steel Company as chemist, and entered the foundry business in 1888 as chemist for the Crane Company, and from there to the Deering Harvester Co. Three years ago he accepted his present position as superintendent of the Illinois Malleable Iron Co.

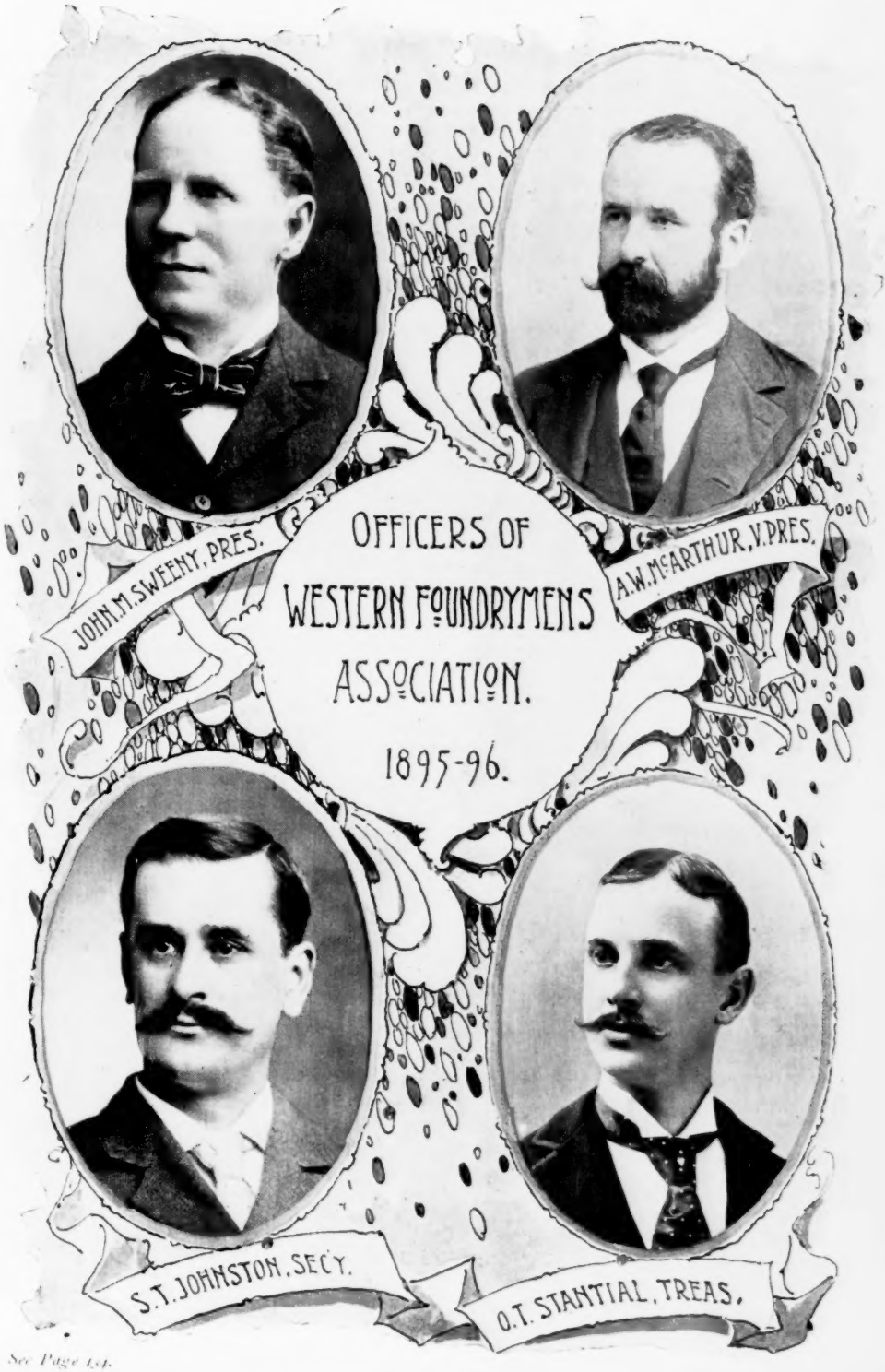
Mr. Stantial has taken a prominent part in some of the recent discussions as to the advisability of giving more attention to the chemical and physical characteristics of cast iron, and from his wide experience his opinion has always been considered of value.

The Western Foundrymen's Association

The annual meeting of the Western Foundrymen's Association was held Wednesday evening, May 15, at the Great Northern Hotel, Chicago, the president, George M. Sargent, in the chair.

The president read the following report:

Gentlemen—During the past year regular


OFFICERS OF
WESTERN FOUNDRYMENS
ASSOCIATION.
1895-96.
JOHN. M. SWEENY, PRES.
A. W. McARTHUR, V. PRES.
S. T. JOHNSTON, SEC'Y.
O. T. STANTIAL, TREAS.

See Page 154.

meetings have been held every month with the exception of August. There has been an average attendance of more than 29. The largest number present at any one meeting was 77. There has been an increase of 45 in membership during the year. The report of the treasurer will show you how the association stands financially. Much interest has been taken in the papers which have been read at various times on subjects pertaining to foundry practices.

The most interesting meeting of the year was held in September, when the association visited in a body, by invitation of Pickands, Brown & Co., the works of the Illinois Steel Company at South Chicago, and in the evening enjoyed a dinner at the Palmer House, afterwards listening to a valuable paper by E. C. Potter, entitled "The Blast Furnace." The members had the pleasure also of listening to remarks from E. A. Wheeler, of Sharon, Pa., Captain R. W. Hunt, Major Pickands and others. Among the papers read during the year was one by Harris Tabor on "Machine Molding," and another on "Future Improvements in Foundry Work," by Herbert M. Ramp.

The question meetings have shown that among our members are those who can talk and know whereof they speak, and herein lies the future success of the association.

The trade papers have shown a very kindly interest in our meetings and have freely given space to the reports of our discussions, and your president would suggest that suitable resolutions, expressing the thanks of the association, should be adopted and forwarded to such papers as ahve taken an interest in the affairs of the association.

Thus far it has been difficult to obtain desirable rooms in which to hold the meetings of the association, and there seems to be no immediate prospect of securing permanent quarters. The Western Railway Club has already appointed a committee for the purpose of securing suitable rooms for its accommodation, and should a committee be appointed by this association to confer with the Railway Club, it is probable that arrangements could be made for this association when the Railway Club takes action in this matter.

The future of this association seems to your president to be full of promise. Among its members are many who are competent and willing to read papers and ably discuss subjects of interest to the association. The discussions held show that our members realize that the future will bring better equipped foundries, improved machinery, more accurate records of daily work and cost cost of the same, and that chemistry will become a necessity. In fact, that all along the line progress will be the watchword. Hence the need of an association in our midst such as this, where knowledge can be diffused and attention drawn to the improvement of foundry work and economy. In retiring from his official position your president most sincerely thanks the members of the association for their uniform courtesy and their aid in making interesting and profitable the regular monthly meetings. It is proper you should know and it is a pleasure to express a word in regard to your efficient secretary, on whom has fallen the bulk of the work of the association during the year, for it is he who has secured the papers which have been read, arranged for rooms in which to hold our meetings, and generally looked after the details necessary for their success.

sor in that he will preside over such an intelligent membership, and he further congratulates the members that whichever their choice of names mentioned for president shall be selected, the association will have a president who will be worthy of confidence and esteem.

The treasurer, H. S. Vrooman, submitted a detailed report of the receipts and disbursements during the year, a synopsis of which is as follows:

Total receipts this year	$642.50
Total receipts last year	301.11
Increase in receipts over last year	$341.39
Total expenditure this year	$608.50
Total expenditure last year	293.25
Increase in expenditure over last year	$315.25

eport of B. M. Gardner, secretary, was as follows:

I have no formal report to make, as the report of the president covers very thoroughly the proceedings of the association during the past year. I would like, however, to make a statement.

The treasurer's report shows that there is a balance on hand of $40.86. There is also

due from unpaid bills $150, making a total of $190.86. We have liabilities of $180.80, which is made up of bills for printing. This leaves a balance of $10.06. In some cases our constitution and by-laws are hard to work under because they are not complete enough to enable the officers to perform their duties properly. I think it would be advisable at this meeting, or at an early meeting that a committee on constitution and by-laws be appointed to go over carefully the constitution and by-laws and to report as soon as possible to the association any revision that they may deem necessary to make. I think this would be a very wise move and result in a great deal of good to the association.

The officers for the ensuing year were then elected. (See page 134.)

Gavel presented W. F. A. by Garden City Sand Co.

Executive Committee, B. M. Gardner, C. A. Sercomb, W. N. Moore, Geo. M. Sargent and James Frake.

During the balloting for officers H. S. Vrooman made the following presentation: I have a very pleasant and agreeable task to perform in presenting to the association a relic and souvenir. Knowing that the association has no gavel, I have been able to secure one which is made from a piece of wood that has a histtory. It was given to me by G. S. Whitslar, agent for the Graham & Morton Company, and is a piece from the steamship "Chicora," which, with 24 men on board, was lost in Lake Michigan, aJnuary 24, 1895. The piece was picked up April 13 by the tug "Haskley." I present this association with the gavel from the Garden City Sand Company, and ask that it may be accepted as coming from one who has the interests of the association at heart. I submit a letter from Mr. Whitslar as a proof that it is genuine.

A resolution of thanks was adopted by the association. The retiring president appointed Mr. Moore and Mr. Sercomb as a committee to escort the new president to the chair.

In taking the chair Mr. Sweeney made a few remarks indicative of his desire to perform the duties of his office to the satisfaction of the members and was generously applauded.

The following applicants were elected members of the association: Union Malleable Iron Works, Moline, Ill.; Gale Manufacturing Co., Albion, Mich., and F. M. Lyon, Burlington Route Foundry, Aurora, Ill.

It was moved and carried that the secretary have a silver plate with an inscription and date placed on the gavel presented to the association.

The chair presented the following resolution, which was adopted:

Resolved, That whereas it has not been the practice to audit the books of the association; and whereas the retiring treasurer requests that the books be audited, the chair appoint a committee of three to audit the accounts of the association and report fully thereon at the next meeting, and that the committee be authorized also to report upon the advisibility of incorporating the association under the laws of the State of Illinois, and if thought advisable shall present the necessary papers so that the association if it chooses can take action at that time.

A vote of thanks was extended to the retiring officers for the efficient manner in which they had conducted the affairs of the association in the past year.

Odd Jobs.

H. HANSEN.

"Can you make me one of this?" is an inquiry often addressed to the "boss" by someone approaching him with a broken casting, wishing to secure a new one in its place and that as a rule on short order, too. It sometimes requires a good deal of mental calculation before such a question can be answered, for generally no one begrudges paying a fair price for a breakdown job and this stimulates the chief of the foundry to greater exertions than would otherwise be exercised, as he hates to see a paying job go away, just because he cannot quite see his way through it, and what is worse still, his competitors may be applied to for relief if he should fail, and what if this inferior being should accomplish what he had declared impracticable, it would be humiliating.

Fig. 1 shows a broken sheave wheel, in whose place a new one is wanted. Originally the pattern for this casting may have been a split pattern, making it a "three parted" job, or it may have had a core print around the circumference to receive the core forming the grove, thus making it a simple, or two-parted job. As now appearing it is neither, for to get the broken wheel split through the center at a right angle to its axis, would be to make it an

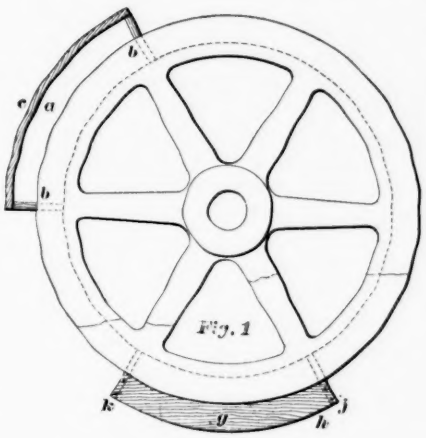


Fig. 1

Fig. 2

expensive pattern, and to fit a core print around it and make a core box to match would also cost considerable, and what is more, would occupy an undesirable length of time.

The question therefore narrows down to getting some simple and cheap contrivance that will answer the purpose; such a one is

Fig. 3

shown at (a) Fig. 1. The rim of the wheel has been divided into six equal spaces and one of these has been "fenced in" as shown, the strips (b) (b) being placed at the right angle to insure of the cores fitting together properly, the strip (c) forms the outside of the core and also helps to hold the strips (b) (b) in place.

In ramming up the core with this arrangement, the pattern or old casting (a part of it will do) should be placed on a core plate (d) Fig. 2, and leveled up, after which ram up some block sand and make a joint with the line (e). The core box (a) can now be placed in position and rammed up, being leveled off even with the next joint line (f). The wheel can now be rapped lightly away from the core, a little black sand gently tucked underneath the core, where left unsupported by the withdrawal of the wheel, and the core box (a) removed, when core No. 1 is ready for the oven.

Fig. 4

At (g) another plan is shown, consisting of two pieces of boards (h) Fig. 1, and (h i) Fig. 3 sawed to the corresponding circle and fastened to the dividing blocks (j k); this obviates the necessty for placing the pattern on a core plate and making a joint at (l), as with this rigging the core can be made in any convenient position, the straight edge (m) being used to strike off the outside circumference, after being rammed up. With this arrangement the core cannot be left on its side to dry as at

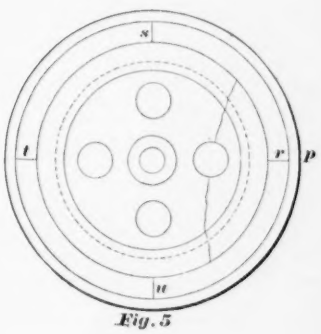


Fig. 5

(a), as this would not permit of the strips (h) or (i) being removed; the core must therefore be placed upon its circumference, and some heap sand tucked under the ends to support it in this position.

The same purpose is accomplished in both of the above mentioned contrivances, and

but little difference exists in their appliance, except that in the latter the cores will be found of an evener thickness throughout, as in the former the molder can vary this to some extent by the way in which he locates the joint lines, which, of course, is greatly a matter of judgment.

Fig. 4 shows the sweep employed to form the required core print, and the way it is applied after the cope has been lifted off.

At Fig. 5 and 6 is shown a different plan for making the cores needed, and is applicable to all of the smaller sizes of sheave wheels. It consists in leveling up all of the broken wheel on a core plate (n) Fig 6, and making a joint all around with black sand on the line (o); place a pulley ring pattern (p) or any other ring that is convenient on this joint, taking care to have the wheel in the exact center of it. Now ram up the space between the wheel and ring pattern

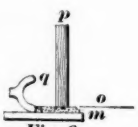


Fig. 6

with core sand, making a joint at (q), withdraw the ring pattern, and with a piece of sheet tin or other thin instrument divide the core in as many places as desired, as at (r), (s), (t), (u); rap the pattern lightly, which moves the cores outwards away from the wheel and apart from each other, until sufficient clearance appears to allow of the wheel being removed, when the cores are ready for the oven.

It is always best when following the last plan to mark the cores, so that they can be placed in the mold in the same position as originally made, for although they form a circle, still it is very difficult to separate them in the manner shown and obtain perfect interchangeability.

The Plumbago Club.

The Stove Manufacturers' meeting at the Auditorium Hotel in Chicago last month was too good an opportunity to call a meeting of the Plumbago Club to be overlooked and consequently when the members received a notice of the meeting from President Hill they all felt that he was alive to the opportunity it furnished for them to meet and hold a social session. Of course there was no reason why they should not also take advantage of the chance it gave them to meet a few of their customers in the lobby of the hotel or even in the cafe, where a number of chairs and tables were conveniently placed for the accommodation of those who might be overtaken with "that tired feeling," the tables being intended for the display of "samples."

They did not all arrive at the same time; on the contrary, some did not reach there till the third day. This was easily understood, however, when it is remembered that on the evening of that day was held the celebrated banquet at the Auditorium Hotel, at which several members occupied conspicuous places but made no speeches.

The fact that all the members of the club then in town had accepted invitations from Secretary Frohman and Doorkeeper Hill to attend the theater the evening previous and amused themselves in various ways for several hours after might have something to do with this.

The meeting was called for Thursday evening, May 2, in the parlors of the hotel, and all were on hand promptly except President Hibbs, from whom the secretary had a letter explaining his absence. While it was apparent that one or two of those present were a little dazzled by the elegance of their surroundings, evidently not being accustomed to such luxurious apartments, they soon began to feel at home and by the time Vice-President J. D. Smith called the meeting to order all were comfortably enjoying the Auditorium upholstery in a way that showed they appreciated the fact that as members of the club nothing was too good for them.

The secretary announced that he had a letter from the president, as follows:

Office of J. W. Paxson & Co.,
Philadelphia, Pa., April 31, '95.

H. F. Frohman, Secretary Plumbago Club:

Dear Sir—Owing to the fact that an income tax law has passed our national legislature, I find at the last moment that it will be impossible for me to get away. Our entire office force has been busy for some days endeavoring to find the amount of our profits during the past year in order that we may render an exact statement to the government. Although we find so far that our total facing business amounted to over 15,000,000 pounds, with several months to

hear from, we have not yet found any profit. In addition to this the attorney-general of the State of New Jersey has commenced proceedings against our firm for stealing a part of that state. It seems that the immense amount of New Jersey sand shipped out of that state by us last year has had the effect of materially reducing it in size and they fear if we continue that there will be no room left for the mosquitoes and goats to say nothing of the Joseph Dixon Crucible Co., of which you may have heard. I trust, however, that the good work may go on in my absence. Above all let the club devote its best efforts to elevating the standing of our business and those engaged in it by encouraging only the most honorable methods and discountenancing all that savors of exaggeration and falsehood.

Yours in the cause,
JOSEPH S. HIBBS,
President.

As the secretary took his seat a most oppresive silence ensued, broken only by the heavy breathing of Mr. Hill, who had fallen asleep owing to an overdose of banquet taken the night before.

The first one to recover his equilibrium was Mr. Griffith who (smiling, of course) raised a few windows and after the admission of a little pure, fresh air from Chicago's great lake the entire party began to revive. Mr. Millns with that good nature for which he is so characteristic, touched the button and in a few moments all felt better.

The matter of locating a permanent headquarters for the club was then taken up and discussed. Mr. Frohman said the committee had been unable to agree, as each one appeared to think different. The president thought it would be nice to have it located in Philadelphia, the home of the Liberty Bell, the Declaration of Independence ,to say nothing of himself, while Mr. Frohman modestly referred to the westward tendency of the center of civilization, the World's Fair and Chicago's lake front and the fact that he lived in the Windy City and was as usual glad to entertain his friends. Mr. Bullock said he felt neutral in the matter, and had no axes to grind; he was getting along very well, thank you, and his customers would buy no other goods than his whether the Plumbago Club was located east or west. After considerable discussion Vice-President Smith called Mr. Bullock to the chair and criticised the committee for not coming at an agreement. It would be in his opinion a fatal mistake to go to either extreme, as there were many things to be considered. He felt that Cincinnati was the natural and logical home of the club, apart from the fact that it had its birth there. Besides its central location, it was known far and wide as being the hub of the foundry supply business and foundrymen generally placed extra value on goods shipped from there. Aside from all this there were other considerations. Everyone knew that the great prominence that city had attained in that line had been due to the efforts largely of one man, whose name had added lustre to its roll of citizens whose industry and integrity had enabled him to build up a business of mammoth proportions. His constant desire for improvement had led to the discovery of new methods and several new brands of goods of a superior quality was the result. It was needless in that audience to say that he referred to the head of the S. Obemayer Co., a gentleman he had learned to admire and respect, and he felt sure the club would be only performing an act of courtesy by locating in the city he had helped to make so famous. As the vice-president concluded it could be easily seen that his speech had had the desired result.

Mr. Millns, however, took the opportunity of saying that he appreciated all the vice-president had said and as he had himself invented a few facings that had stood the test of time and hot iron, he felt that he could appropriately support the previous speaker and made a motion to that effect.

Mr. Bullock said that while what had been said was news to him, he would cheerfully support the motion and it was declared carried unanimously. The committee on furniture said it had been impossible to do anything until the matter of location had been decided and promised a full report at the next meeting.

The secretary said the committee on by-laws were having some trouble over one or two sections, but expected to have them all straightened out by next meeting. He also announced that he had two applications for membership, one from H. S. Vrooman, of the Garden City Sand Co., Chicago, who was a practical molder and had been selling the trade in Chicago for some years and had made a record that they might all be proud of. In addition he had been treasurer of the

Western Foundrymen's Association, handling all its funds, and would make a desirable addition to their membership. The other was C. W. Baird, of the Dixon Crucible Co., Jersey City and a score of other places. They had all heard of that company. It had an original way of doing business. Its traveling men all traveled in palace cars with a stenographer, their customers being notified by wire of their coming. When the train stopped at stations to take water, change passengers and baggage, the customers flocked to the depot and kept the stenographer's pencil flying while they recorded their wants.

They all seemed anxious to admit both gentlemen to membership and they were unanimously elected and escorted to easy seats.

Mr. Vrooman rather staggered even the vice-president by immediately proceeding to make a speech. He said he was pleased to become a member of such an influential body and had desired to show his appreciation in some substantial way of the honor conferred upon him. He took great pleasure, therefore, in presenting the club on behalf of the Garden City Sand Co., with a six-pound gavel with which to aid in the preservation of order at the meetings. The head was made from a mixture of several well-known brands of southern iron kindly donated by Rogers, Brown & Co., Cincinnati, while the handle was made of the aluminum bronze, now being placed on the market by the Cowles Electric Smelting & Aluminum Co., of Lockport, N. Y., and which was renowned for its toughness and beautiful finish. After its acceptance by a unanimous vote and the adoption of a resolution to have the donor's name suitably engraved upon it, the meeting adjourned and followed Messrs. Millns and Bullock to the nearest soda fountain.

The Rammer and its Proper Use.

HERBERT M. RAMP.

An article by Mr. Hansen, in the May number of the Foundry, on "Ramming," brought to mind many little ideas in regard to the subject, and some which do not quite agree with his experience. In the first place, I do not believe it impossible, to describe the art of ramming so the explanation can be made intelligible to the ordinary workman, but do believe it would require a treatise of considerable length to be of any advantage to men who do not thtroughly understand the principle of the business, and merely accomplish their work by rote, or the standard someone else has adopted.

The principle of ramming is the necessary thing to learn first, and examples multiplied and practiced afterwards. Our greatest trouble is, we show numerous examples to those we try to teach, and neglect to impress upon the molder or apprentice the "why" of such practice. Sit down and talk to an apprentice fifteen minutes, explain the reason he does his work in such a manner, and persevere until you have made an impression, and you will see results from your endeavors. Teach him to study cause and effect, to look for the prime factor, and not depend upon the customs and advice of other men.

The rammer is used for two purposes, to make the sand stand and retain its shape, and to resist the pressure of the iron on the mold, and that is all, where there is no pressure or body to stand alone or lift, the rammer is unnecessary, for instance take a plate made in open sand, a bed of soft sand is leveled up, and a plate three inches thick can be made on it successfully, there is no pressure, and it requires no ramming. Who ever saw an open sand plate swell? How many never saw one scab if made a little too hard? The pressure must determine the ramming. How to use the rammer is a question answered in one word—uniformly. The pressure in a mold is one pound to the square inch, for every four inches of height of gate or casting, this pressure is true and perfectly uniform, our ramming is simply the wall that confines or retains this pressure, hence the observation, uniformity, is the essential thing in the work. It is simply building a reservoir to hold pressure or force, evenly distributed. If a man was building a dam to hold water or a filter in his cistern to stand water pressure, he would not drop the bricks around carelessly, and fill in between with loose rubbish, yet this is what molders do too often, they ram here, there, and everywhere, all over the flask or pit, with no system or uniformity in their movements, this is not inability, but carelessness. They put three blows where one would do, and none where it is often needed.

Of course, there are other considerations in ramming, and other points to watch, but the idea of uniform hardness or resistance to pressure, relative to height of gate, is the first and necessary principle to master.

Second, the face of the mold must be left as soft as consistent with the pressure, and free from soft or hard sptos, the softer the surface of a green sand mold is rammed, and at the same time remain capable of resisting the pressure, the better casting will be produced, in eevery way, for the gases can more readily pass through the pores of the sand, and it is capable of expansion without causing the "buckles" we so often find when using plumbago, applied with the hands or brush. It is surprising how soft the surface of a mold can be made, if properly rammed behind, and never show the semblance of a swell. The writer has seen a pile driver thirty-six inches deep made in green sand and the surface of the mold, soft enough at the bottom, so you could push your fingers in it easily, come out with a perfect face, but two or three inches back from the pattern, it was solid and hard. For an example, take a casting twelve or eighteen inches deep, and figure the pressure on it, then figure up the area of the ends of your fingers in a rough way, and compare the force exerted to make an impression on the face of the mold, to the the pressure you would have to bear on a small pair of scales, to reach the required force to equal your pressure. I do not assume a molder is going to carry a pair of scales around with him to weigh how hard he rams, but if he will pay a little attention to the facts of the business and neglect no means however curious they may appear, in a short time his fingers will become educated in feeling, so they will reveal to him instinctively the condition of his work. The result of this experiment, will astonish you at first, when it becomes apparent how soft the face can be and many molders would unreservedly declare, the casting would swell, but for all that it would not, if backed up solid behind.

Here is where the trouble arises. As you go back from the face of the casting, here and there will be a spot or hole where little or no ramming has been done on account of the desultory method of jumping all over the flask in three blows, and the combined area of surface presented to the casting exerts a pressure which forces the face back and constitutes our swells. One rule we can give with some certainty, never ram any closer than two inches from the side of a pattern, under any circumstances, and never ram towards the pattern. It is necessary to keep this distance in order to make the sand pack uniform on the face of the casting. This should be carefully observed and studied, let the molder whose eye is not accurate, take his rule and mark a line two inches from his casting and follow it in ramming, and in a short time he will acquire the power of measuring the distance with his eye correctly. It will also require practice to place the blows time and alike, but this can be accomplished easily. Go over the ground so many times each way, and keep the blows uniform and placed the same distance apart, turn the pean of the rammer at a different angle when covering the same ground twice. Make it an object to acquire these habits, be as uniform in placing blows as the squares on a checker-board, and observe instructions to keep away from the pattern, and the art of ramming well, will be revealed to you even though it be an art, that requires practice and special adaptations.

Don't jam around here and there, like a man trying to poke a hen off a nest in a barrel, but use the most careful system, and educate your hand to follow such practice.

Another item in ramming, worthy of consideration is, nineteen molders out of twenty ram too much, and expend a great deal of useless labor on their work. Often we will see the practice of ramming four or five inches at a time, and you will be told, "It is all that can be rammed at once in the proper manner." But such is not true. In almost any case eight inches of sand can be used at a ramming, be it cope or drag. The deeper a ramming a man can use successfully, the more uniform will be the face of his mold, look at our molding machines, they will press twelve inches of sand from one side, and the mold will be more uniform and even than it is possible to attain by hand.

I do not assume a man will use a rammer like an "ax," as Mr. Hansen fittingly called them, or one that only weighs four or five pounds and ram up an eight-inch cope at one peaning; but if he will make a

rammer weighing from eight to ten pounds, making the pean perfectly square, with no taper, the dimensions of end should be 3x ⅞-inches, and strike a blow like he meant to do something, the result will be assured. A rammer should always be heavy enough to carry some force with it, and when once accustomed to its use is easier to work with than a light one, for it does not require near the number of blows to accomplish the work.

Often molders make a little, light, rammer to do heavy work, it reminds one of a farmer tamping around posts with a broomstick, and is just about as reasonable.

Again, molders ram too much, where it is unnecessary. For instance, take a square column, twelve or sixteen inches deep, made in the floor. Many molders fill in six to eight inches of sand and pean it from the pattern back to the side of the pit, in the loose sand, which involves a great deal of labor, which is unnecessary, instead, after filling the sand in, get in the pit and tramp it off, then take the pean rammer and ram a row or strip of sand about three inches wide and two inches from the pattern, good and solid the entire length of the pattern, the remainder of the pit or flask can be run over with the butt rammer once. The amount of hard labor this plan will save is astonishing, and will give sufficient backing for anything up to thirty-six inches in depth. It matters little what the formation of the casting may be, pulleys of that depth can be easily made with no more labor than that, and castings produced that will show neither swell or scab.

Castings twelve inches deep can be easily rammed up in two peanings, and afterwards butted off solid, the practice of using four inches of sand at a ramming, is folly, when eight is used, the same under the rammer is packed down to fully one-half its former depth, namely: Four inches, and this, is little enough, the sand at the side of the ramming and between the pattern, is simply packed by pressure, and not from the direct blow.

Another habit often practiced is to pean over the bottom of a casting and unless there are some ribs or pockets to contend with, such work is absurd. The feet and butt rammer are all that is necessary in such work, being more uniform and rapid. Ramming with the pean directly over a pattern and towards it, unless there is a great deal of sand between, leaves a hard spot where every blow was placed, and uniformity is impossible.

The true principle we are aiming at is to ram the sand around our patterns, in such a way as to withstand the specified pressure, and little more, and any labor expended in excess of this is both unnecessary and dangerous, coupled with this a perfectly uniform surface, which experience teaches cannot be gained by close ramming.

I could write for hours on this subject, and then not exhaust it, and feel I have told little in this article, but if permitted room at a future day, will try and make more intelligible some of my assertions here.

Ste. Genevieve de Bastican, P. Q.,
May 11, 1895.

The Foundry Publishing Co.:

Inclose find a money order for your journal. I love to read this paper. It is instructive for all the business men. Yours truly,

F. LEBLANC.

Hamilton, O., May 1, 1895.

The Foundry Pub. Co., Detroit, Mich.:

Gentlemen—I enclose my check for $1 in payment of my subscription to your publication. Pardon my delay in remitting as I have been very busy and overlooked your statement. I take this opportunity to let you know that I appreciate THE FOUNDRY more than any other publication, no matter what kind it may be and I would not be without it at any cost.

Yours respectfully,
HARRY V. MOORE,
Supt. Foundry, F. & L. Kahn & Bros.

Fluid Iron.

Robert B. Thomson, foreman of the Fulton foundry, Brooklyn, N. Y., writes THE FOUNDRY that he has recently been making some experiments with fluid iron. He says they have succeeded in casting without any trouble some strips, 5 feet long, one-eighth of an inch thick and one inch wide. The edges were perfect; the casting soft so that it drilled and filed easily. It was poured from the end and was moulded perfectly level.

F. A. Taylor, of Kalamazoo, Mich., has purchased the brass works known as the Strait Mfg. Co., in that city, and will conduct it under name of Standard Brass Works.

James Chalmers

The Unvarnished History of a Common Man.

By W. EDWARD.

CHAPTER XVIII.

I concluded to leave the Cotton Belt and strike for Paris over the Santa Fe ,where I hoped to catch a train on the 'Frisco through the Territory to Fort Smith or farther north, but on inquiring of one of the men around the boarding house I found that there were no trains running on Sunday, and I would not be able to catch a north bound freight before noon the next day. As it was a beautiful day and I did not care to hang around the town, where everybody pointed me out as the tramp who had been held for the murder of two men, I concluded to walk as far as the next town that afternoon, so as soon as I had dinner I started up the Santa Fe. I took my time along the road, stopping in several peach orchards and enjoying the luscious fruit, which grows to perfection in that part of the State, so that when I reached the first water tank the sun was still high and, as it was a lonely spot in which I did not care to pass the night, I quickened my steps and walked on to Ladonia, which I reached about eight o'clock. Finding no empty cars on the siding or any other shelter for the night I placed a couple of planks upon a truck and wheeled it to the back of the depot under a projecting roof, where I lay down to rest. Before I had lain very long the town watchman discovered me on his rounds and, after asking me a number of questions about myself, said he could find me a very comfortable place to sleep. Sam Jones, the great preacher, was holding a series of revival meetings under a big tent in the town, and to this tent the watchman took me, gave me a couple of blankets and a bundle of straw and told me he would waken me before any one was stirring in the town. I enjoyed a good night's rest and about six o'clock the watchman wakened me and took me to his home, where he gave me a good breakfast. I hung around the town until about two o'clock, when the north bound local came along and I swung on between two box cars. The conductor saw me get on and at the first stop he came back from the engine and invited me to get off and count the ties, which had become rather monotonous to me, but finding I could not talk him into letting me ride I hopped off again. That night about sundown I reached another small town, where I investefd ten cents for some crackers and cheese, having had nothing to eat since breakfast, and slept on some rolls of tar paper in an unfinished house. It wasn't a very comfortable bed, and as soon as it was light enough for me to see I took the road again. My meals had not been coming very regular for nearly a week and it was beginning to tell on my strength, besides I was tired and stiff from my walking of the three or four previous days, so that I did not make very much headway, and when I struck a little town about noon, only eight miles from where I had started in the morning, I made up my mind that I wouldn't walk another mile if I never got out of Texas. I hunted up an eating house, of which every town in the South seems to be plentifully supplied, and, after giving the proprietor a good "song," they fixed me up a square meal for fifteen cents. I felt better after my dinner, but my feet were sore and I concluded that I did not want any more walking in mine, so I sat in the shade in front of the restaurant and rested until I heard the whistle of the local.

When the train pulled in I was on the look out for an empty box car, but finding none on the train I climbed into a new gondola, with high sides, and sat down on the bottom of the car with my back against the end gate. The sides of the car were of yellow pine and when I sat down I did not notice that the sun had drawn the resin out of the wood and that the end gate was oozing from every pore with the sticky stuff. I soon found it out, however, when the jolting of the train threw me to one side and my coat hung fast. I had hard work to pull it loose and when I did I could see the print of my shoulders on the wood and the back of my coat was covered with the yellow resin, making me tougher looking than I was before. None of the train crew bothered me and we reached Paris about eight o'clock that evening. I walked up into the town as soon as the train pulled into the yard to see what kind of a place it was, and the first man I saw on the court house square was

a hot tamala man. I walked past him sniffing the odor of the tamalas, but the smell was tempting and I was hungry, so, after mature consideration, I walked back and spent my last nickel for a couple of hot tamalas, which I ate with considerable relish. I had intended to camp for the night in a box car in the yard and before coming up I had selected one which I thought would suit, but in walking around the town I suied an old stage-coach standing in a vacant lot, which I thought would answer my purpose better. Looking around to see that I was not observed, I climbed over the fence to examine it. The cushions were still on the seats and the body of the coach was wide enough for me to stretch at full length, so I pulled down the blinds and settled myself for a good night's sleep.

The next morning I hunted up the only foundry in the town, and a sorry looking place it was. They only worked two molders, one an old man who told me he was over eighty years of age, and the other a young fellow about my own age, who, the old man told me, worked on the farm of the proprietor when the work was slack in the shop. The old fellow had been a rounder in his days and he entertained me for two or three hours telling me of his travels. In 1835 he had come from New York to fight under Sam Houston in the war for the independence of Texas, and when the gold fever broke out in 1849 he had crossed the mountains with a party of prospectors to California, where he had made plenty of money, but had let it go about as fast as he got it. He was in Texas when the war of the Rebellion broke out, but refused to fight against the Union, and had gone North, where he enlisted in an Indiana regiment and fought through four years of the war. After the war he had worked at his trade through most of the Northern States, and in his old age he had drifted back to Texas, where he expected to end his days, but he looked chipper and hearty enough then, and I have no doubt he is still living.

Finding no show for a job in Paris, I went down to the 'Frisco yard to find out what time the trains left. Two freights had just pulled out before I got there, and there would be no more freight trains until the next morning, so I went back to the shop and sat there talking to the old man most of the day. I was getting very hungry, having eaten nothing all that day, and along toward evening I concluded to try and find something to eat. I must have walked around for two hours before I could screw up courage enough to ask for a "handout," but I finally selected a house and made up my mind that I had either to beg or starve, so I walked up to the house and just as I was about to knock a young girl came to the door. If I had seen her coming I believe I would have run away, but when she opened the door just as I reached it I had to tell her what I wanted. She invited me to sit down on the step and in a few minutes she brought me a cup of coffee, a boiled egg and one small biscuit. Such a meal to set before a hungry man. Why, it wasn't enough for a bird and I felt hungry enough to eat an ox. I thanked her, however, and almost before she had closed the door the biscuit and egg had disappeared and I was wishing for more. Instead of appeasing my hunger what I had eaten seemed only to sharpen my appetite, and I determined to have a meal if I had to go to a dozen houses to get it. The next place I "tackled" was the home of a railroad man. They were at supper when I rapped at the door and his wife came to see what was wanted. When I asked her for something to eat she refused and I was turning away when the man called me back. I heard him tell his wife that he had been in the same fix himself and he would never turn a hungry man away from his door, so I sat down on the step and in a few minutes he came out with a heaping plate of meat, potatoes and bread, and a cup of coffee, and said if I wanted any more I had only to ask for it. I felt very much better after I had finished the contents of that plate, and after strolling around the town until about nine o'colck I turned in at the old stage-coach again and passed the night.

The next morning I was down at the yards bright and early, waiting for a chance to get out. When a train was finally made up and ready to pull out I saw the conductor and one of the brakemen walking along the train, looking in all the cars for "hobos" and closing the doors of the empties, so I thought there was a poor show for me, but

as there would be no more trains until the next morning, and it was a rather ticklish job to ride blind baggage through the Territory I concluded to chance it. I waited until the train started to pull out, then I jumped on a gondola between two box cars and sat down on the brake. Before we had gone very far the conductor came along and asked me where I was going. I told him the luck I had had in the past week and asked him if he could not carry me as far as Tuskahoma, but it was no go. He said Texas was full of work and if I wanted to run away from it the walking was good, but he'd be —— if he would carry any lazy ptramps on his train, and ordered me to get off at the first stop. In about fifteen minutes the train slowed up at a flag station, but as it did not stop I concluded to stay on the train until they made a full stop. I expected the "con" and one of the "brakies" to come along and try to put me off, and I made up my mind to give them a tussle if they tried it, but they didn't bother me and I rode until we came to the bridge over the Red river. Part of the bridge had been washed away that spring and there were several hundred men and three work trains at work repairing it. As the train pulled into the station I thought it would be better for me to get off there and look for a job than to run the risk of being put off at some place in the Territory, where no trains stopped and where I might starve to death. As I jumped off I saw on the siding a pile-driver train with the engine coupled, as if ready to pull out, and seeing a man sitting in the door of a sleeping car nursing his hand, which was tied up in bandages, I asked him where they were going and if he thought there was any show for a job. He said that they were going up to Fayette City, Arkansas, and he thought there was a good show for a job, as he had mashed his hand the night before trying to make a coupling and another man had quit. "But," he added, "here comes the 'boss' and it will do no harm to 'tackle' him." Just then the "boss" came running along with his orders in his hand, and I stopped him to ask if there was any show for a job. He sized me up for a moment and asked if a had ever worked on a pile-driver. I said I had never seen one before. Then he asked whether I could handle an ax, but as I was rather slow in answering this question he said, "All right, jump on here and get your dinner; I guess I can find some use for you." Not waiting for a second invitation, I climbed into the dining car and found a seat at the table with the rest of the men and no sooner had we finished dinner that the signal was given and we pulled out at a lively rate, only stopping once for water until we reached Tuskahoma about seven o'clock, where we laid up for the night.

I hadn't the slightest idea of what work would be required of me, so I asked one of the men and he said that the new men were always put in the "ax gang," sharpening the ends of the piling so they would drive easy. He had been in the "ax gang" for five months, but had been promoted to the position of "signalman." That is, he stood on the ne dof the driver and signaled to the engineer to strike light or heavy blows, to start up or stop, and besides it was a part ot his work to oil the various parts of the machine. This place was looked upon by all of the crew as the snap job on the train. Besides the "ax gang" there were the men who held the pile in position with wooden pikes, to keep it driving straight. All of the crew, excepting the "boss" and the engineers, were paid $1.75 a day, and out of this we had to pay $4.00 a week for board. The next morning we had to make a run to Winding Stair mountain, drive a dozen piles on the main line and get to Fort Smith ahead of the evening express, and we had to work lively in order to get out of the way on time. We carried a car load of piles with us and, as soon as we had arrived at the place and rolled off a number of piles with cant hooks, the "boss" handed me an ax and told me to jump on the end ot a pile and sharpen it as I saw the other men doing. I hopped out and commenced to swing the ax at a lively rate when the "boss" yelled at me , "Drop that ax, ——you, do you want to cut your feet off?" I dropped the ax rather sheepishly, as I was ashamed of my awkwardness when I saw how skillfully the other men swung their axes and made every lick count. Then he called me to climb up on the driver and said, "I want you to stand here and watch this man drive one pile and then I want you to take his place, but be

careful of your signals or you may kill some of us." I stood and watched closely every signal that was made while the pile was being driven, then I took the place of the "signalman," while the man who had been promoted took up the ax and commenced to charpen piles, cursing my awkwardness and his bad luck. I was very careful to make no mistake in my signals to the engineer and we drove the twelve piles without any further trouble. Dinner was ready as soon as we had lowered the hammer tower and swung it into place and, the engineer and fireman having already eaten their dinner, before we were all seated at the table the train pulled out and was soon running at the rate of thirty miles an hour for Ft. Smith. We arrived at Ft. Smith about five o'clock and lay there on the siding until the express passed and then pulled out again for Chester, which is the end of a freight division, and where we laid up for the night.

The next morning the boss got orders to leave his train at Chester and to run the driver into the shops at Springfield for repairs. I found that most of the crew were going up to Springfield and I wanted to go with the rest, but the "boss" asked me to stay and take care of Peters, the man who has mashed his hand. After the crew left Peters and I hung around for a few days, doing very little but eating and sleeping. His hand was very painful, he having had no medical attention since the accident. The middle finger of the left hand was mashed at the second joint and he proposed that I cut it off. I didn't like the job very well, but from the way it looked, if the finger was not taken off he might loose his hand, or maybe his life from blood poisoning, as the finger began to show signs of gangrene, so I consented to take it off. After binding a bandage firmly around his forearm, so as to stop the circulation, I tied his arm down to the table so that he could not move it, and, having previously put a good edge on my razor, I managed to amputate the finger and dress it in a satisfactory manner. After the amputation he did not suffer so much pain, and in a few days the flesh began to grow firm over the stump. As it was only thirty miles to Ft. Smith I took a run down to see what they were doing, and if I knew any of the boys working there. There were only Frank Mudd, Charlie Horst and Ed. Thornton, besides a couple of cubs working, and the were not doing very much, on account of the rain which was keeping building operations back. Herst offered to hold me up for a week on the expectation of work coming in, but I thought I might as well be on the pile-driver as hanging around Ft. Smith with nothing to do, so I concluded to go back to Chester and stick to the job I had until something better turned up. Before I left Herst insisted on giving me a couple of dollars for pocket money, which was very acceptable, as I had been out of tobacco for several days and Peters was just as bad off. The day after I had been to Ft. Smith I picked up a Globe-Democrat and saw an advertisement for four moulders to go to Springfield. It was Saturday evening and I thought I would have as good show as any one by being there early Monday morning, so I concluded to strike for Springfield that night. I told Peters to explain matters to the "boss" and be gan to look for a train. About midnight I caught a cattle train going north and, by showing the advertisement and my card to the "con," I fixed myself for a ride to Monette in the caboose. At Monette I struck another train, and the next afternoon about five o'clock I rolled into Springfield.

(Continued.)

A Set of Office Rules.

They must have a humorist somewhere connected with the J. R. Thomas Machine Co., at Green Bay, Wis., judging from the following, which they have posted in a conspicuous place in their office:

OUR OFFICE RULES.

Time allowed for interviews in business hours:

	Hours.	Min.	Sec.
Friendly calls	0	2	0
Friendly calls when busy	0	1	0
Life insurance agents	0	0	½
Book agents	0	0	0
Friends with a great scheme	0	0	5
Same willing to let us in on the ground floor	0	0	1
Friends who want us to go fishing	0	0	42
Friends who want us to go to lunch	0	10	0
Friends who want to borrow $5.00	0	0	3
Friends who want to borrow $10.00	0	0	2
Friends who want to borrow over $10.00	0	0	0
Traveling salesmen with expense accounts	2	30	0
Traveling salesmen paying their own expenses	0	2	30
Bores, male	0	1	0
Bores, female	0	0	0
Customers in general	6	0	0
Customers who want to buy	12	0	0
Customers who want to buy at list price		No limit	